The IRON AGE

January 14, 1960 A Chilton Publication The National Metalworking Weekly

Lockheed's Van Horn, Hoole and Gribbon—

Punched Tape Gives Jig Borer 3-D Control P. 63

Why Industry Needs More Generalists – P. 23

Steel Settlement Post Mortems – P. 26

Digest of the Week – P. 2-3

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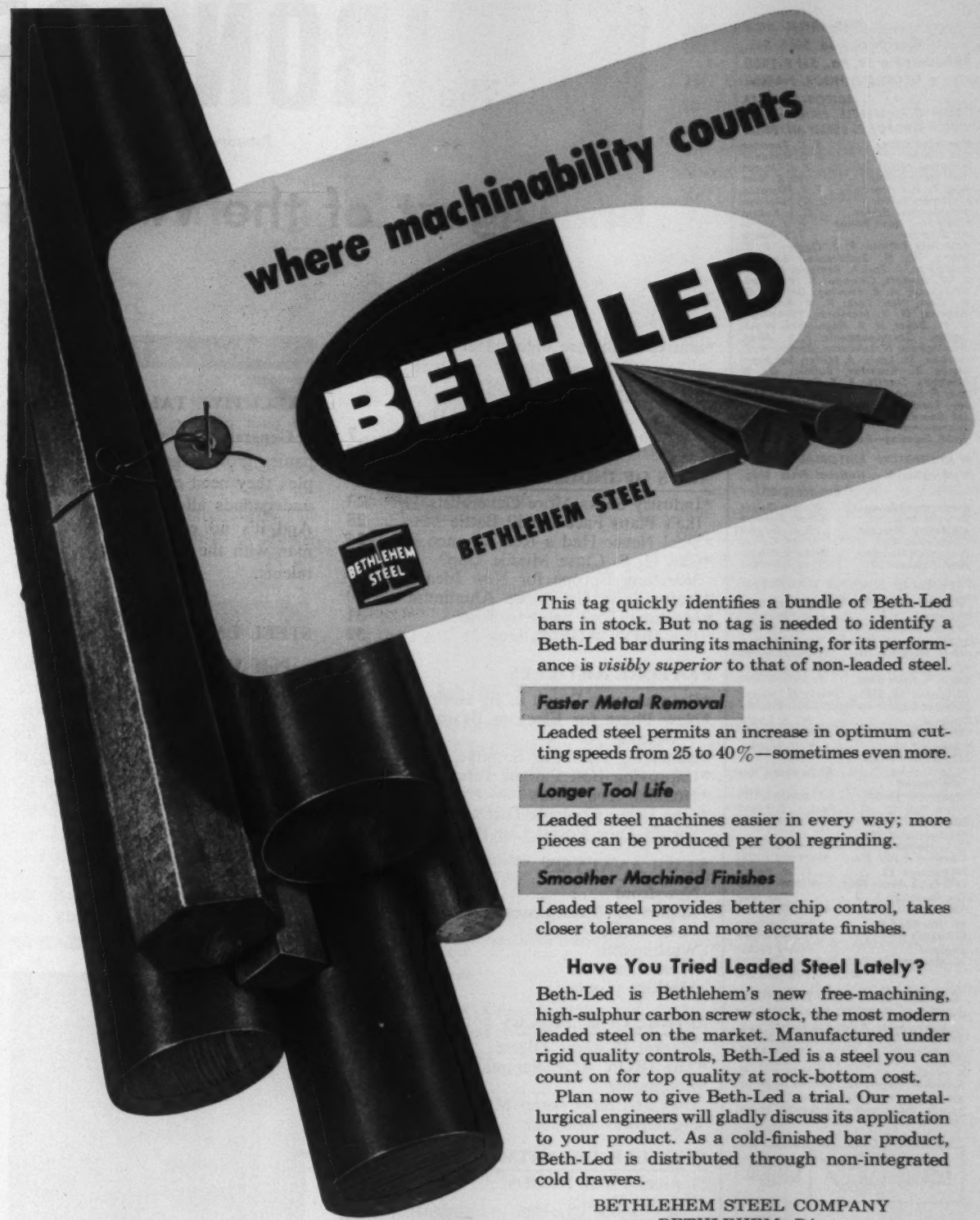

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January 14, 1960—Vol. 185, No. 2

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EXECUTIVE TALENT

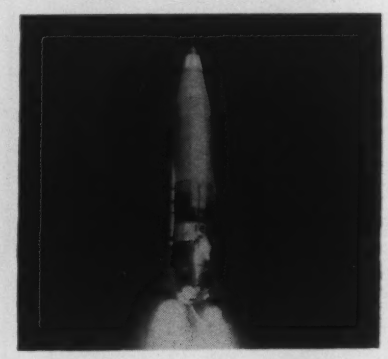
Generalists Wanted — As companies grow larger and more complex they need executive talent that understands all phases of business. And it's no easy task finding the man with the right combination of talents. P. 23

STEEL LABOR

Post Mortems — After the government got into the steel picture, all the union had to do was wait it out. Thoughts now turn to the years ahead, and the possibility of improved labor relations as the result of lessons learned. P. 26

SPACE POWER

Closing the Gap—Although the U. S. lags far behind Russia now in space vehicle technology, proj-



ects are under way that may close the gap before generally expected. Engines with far greater thrust are past the test stage. P. 28

Metalworking

◀ COVER FEATURE

JIG BORING: Accuracy is a must to men like Walter Van Horn, Arthur Heale and D. J. Gribbon, all from Lockheed Missiles and Space Div. Its new tape-controlled jig borer takes care of the third dimension: Depth of bore. P. 63

ALUMINUM IN AUTOS

More in '60 — Alcoa figures the average 1960 car will use about 10.8 pct more aluminum than the average 1959. It also figures the average for the new U. S. compact cars is 73 lb per car, 17 over industry average. Automakers will use about 365 million lb of aluminum in 1960. P. 30

FEATURE ARTICLES

ELECTRON BEAM WELDING

A Production Tool? — Bridging the gap between research and actual production has been difficult for electron beam welding. One of the main reasons for the delay has been the equipment's "solid gold" price tag. But a new, less costly unit may give the process the push it needs to reach the goal. P. 66

CLEARING THE AIR

From Busy Plants—Adding exhausts without boosting air supply can create problems, especially in winter. Working in a partial vacuum affects worker output and morale. There's a simple remedy in roof-mounted heat-air units. This system provides a balanced supply of air in the plant. P. 68

BETTER THREAD DESIGN

Added Life — High-tensile bolts occupy an important position in today's aircraft programs. But now they should become even more valuable, thanks to a slight but extremely vital alteration in thread design. Tests show it doubles fatigue life in nuts and bolts. P. 71

NODULAR IRON GEARS

For Rough Use—Instead of rating below steel gears in performance, nodular iron gears are proving themselves equal to the toughest applications. From the standpoint of pitting, scoring and beam strength, nodular iron gears are the equal of steel gears. P. 74

TURRET LATHE CONTROL

From One Lever — A machine tool maker redesigned its line of vertical turret lathes to keep pace with the growing demand for higher production rates. Each unit is controlled by a single lever; it cuts downtime and makes operation a simple matter. P. 76

MARKETS & PRICES

TOOL SALES

On the Way Up—Machine tool sales are expected to show a 30 pct improvement over 1959. But they still have a long way to go before they recover the volume lost in recent years. P. 31

WEST COAST

Busy Decade Ahead — Population growth, new households, industrial expansion all add up to a strong decade for the Farwest. Here's a state-by-state rundown on what to expect. P. 47

STEEL SUMMARY

First Half Record—Uncertainty over steel prices will keep pressure on the market even after supply eases as a hedge against higher prices—if increases don't come first. In any event, a first half production record is assured. P. 97

PURCHASING

Furnace Price Increases? — Makers of industrial furnaces had hoped to hold the price line. But prospects of a steel price hike sometime in '60 make this less likely now. P. 98

NEXT WEEK

EUROPEAN MARKETS

New Horizons—More and more American companies are planning to invest in Europe's growing markets. Next week's special report tells how they're going about it and some of the problems facing them.

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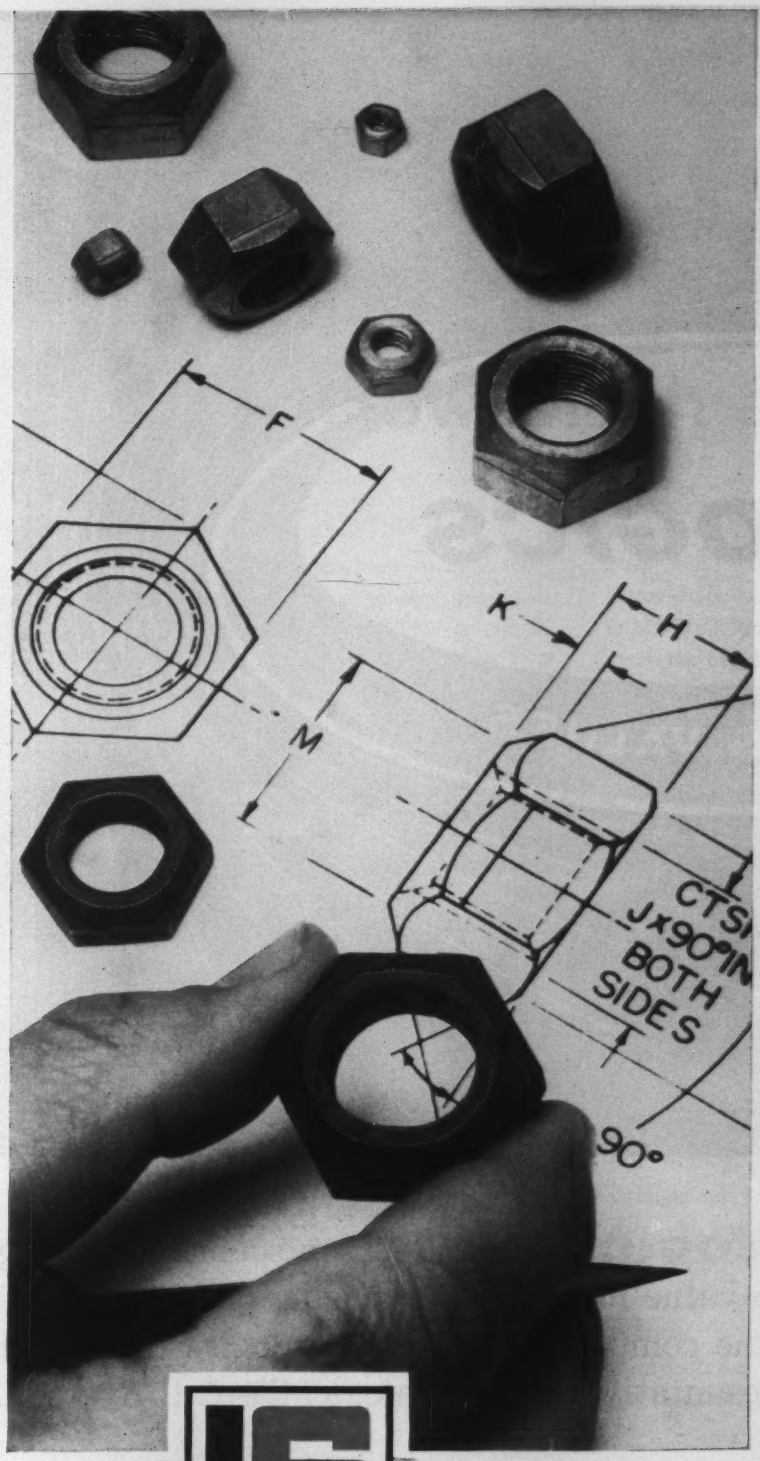

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Car and tractor makers alone used about 80 million new-style Stover Lock Nuts in 1959. Reasons: savings in assembly, savings via improved squeak-rattle resistance in suspensions, steering linkage, chassis, engines, bodies.

You save in assembly: The new Stover needs only about ¾ the tightening torque to produce the same clamping force in bolts as produced by comparable standard fasteners and competitive lock nuts. Many companies are cashing in on this lower torque requirement by using air stall drivers, both single and multi-spindle. They're handy to use, stingy on air, economical to buy and maintain.

You save after the sale: Using your present drivers and air pressures, the new Stover Lock Nuts will draw up 33% tighter than comparable standard fasteners and competitive lock nuts—a whopping extra margin in squeak-rattle resistance and safe operation. Benefits: lower service costs, happier customers, repeat sales.

What's available: From ¼" dia. to 1½" dia. in fine and coarse thread. Grade A is for use on bolt and stud grades SAE 2 and lower; Grade B for use on SAE grades 3, 4 and 5 bolts and studs; Grade C for use with SAE grades 6, 7 and 8 bolts and studs. Stover nuts for use with machine screws No. 8 and larger are available on special order as are stainless steel and non-ferrous. Where space is a problem, such as on pinion and pulley shafts, Stover jam (thin) collar-type nuts in grades A and C are recommended.

For engineering information, price data and samples, contact Lamson & Sessions.

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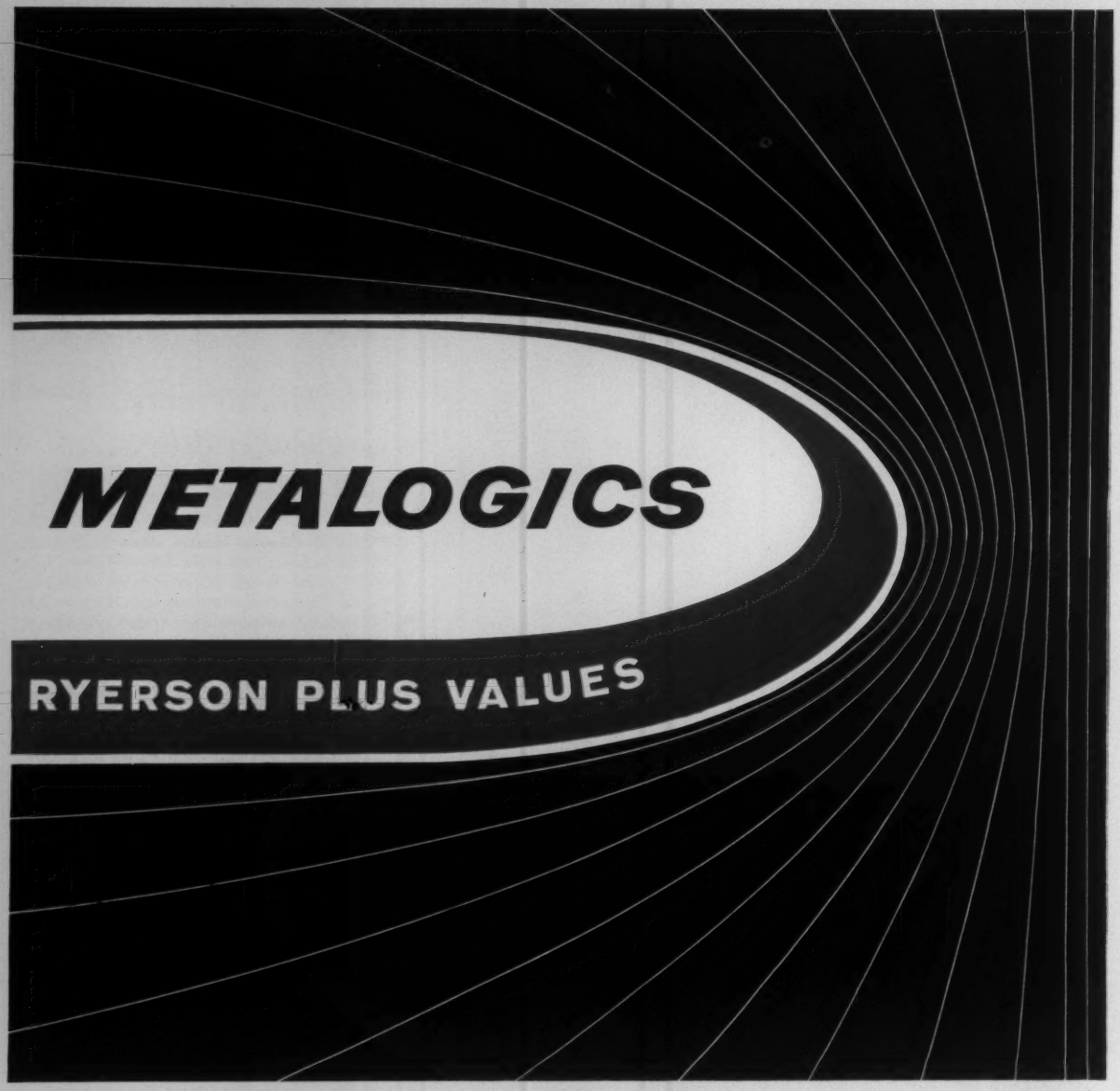

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Whither Steel Prices? When, How Much and Why?

There comes a time when some managements must think only of their stockholders, their own jobs, and their future strength. This is one of those times—for many steel firms.

The steel industry was badly beaten in the latest wage-fringe-inflation hassle. There is no other answer. It got triple-A for effort and C-minus for accomplishment.

The Government forced this one again as it has in the past. Maybe the settlement was better than the alternative. Maybe there was a good chance of a cheaper settlement—had the industry dropped (or never injected) the local practices clause. All this is academic now.

The point this week is that many steel firms who can't afford the wage-fringe package are in trouble. They know it. The bigger steel firms know it. The Government knows it. The union ought to know it. What happens now?

Everyone wants to see inflation licked. It is necessary to hold prices in check. But before that can happen, wages must be held in check.

The wage-fringe package is inflationary. It will mean higher prices. The longer some steel firms wait, the more serious becomes the problem of safely paying for the wage deal.

The way competition is in steel, some of bigger units with more up-to-date equipment are in better shape to refrain from hiking prices—now. Other firms are not so fortunate. Yet they must carry the flag for anti-inflation too.

But how far should the management of a company go under free enterprise to carry on, aid, or abet a crusade? No matter how great the cause, no matter how important the outcome, some firms have to stay in business or their whole shebang goes down—or nearly tumbles.

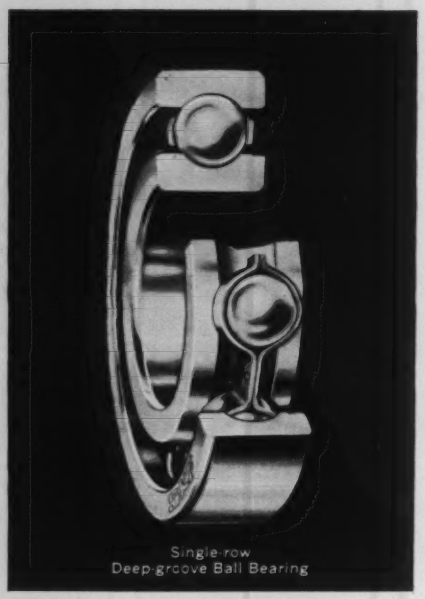
The steel leaders in the bigger companies made no pact with Vice-President Nixon not to raise prices. To do so would not only have been idiotic but it would have been illegal as well. Nor was there any commitment that major firms would raise prices "after Dec. 1" when the wage hike goes in.

Such deals would have been the crudest kind of reasoning. If there be those in steel who feel it might be well to get a little experience with cost, more power to them. But it may be that some firms don't need that experience—they know right now what ought to be done.

Sooner or later there will be a moderate steel price increase. If not, then Government has dictated and the free market is gone.

Tom Campbell

Editor-in-Chief



Can a standard bearing offer you "more bearing" for your money?

It can if it's made by SKF—because all SKF bearings, both ball and roller, offer special qualities at "production" bearing prices.

Take the single-row deep-groove ball bearing featured here, as an example. SKF designs and builds this type to sustain heavy radial load and thrust load in either direction. Furthermore, it is engineered to run smoothly and quietly at normal speeds with grease lubrication—and at high speeds with oil.

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But why not find out what SKF offers in bearing quality, availability and economy? Just call the SKF branch office nearest you.

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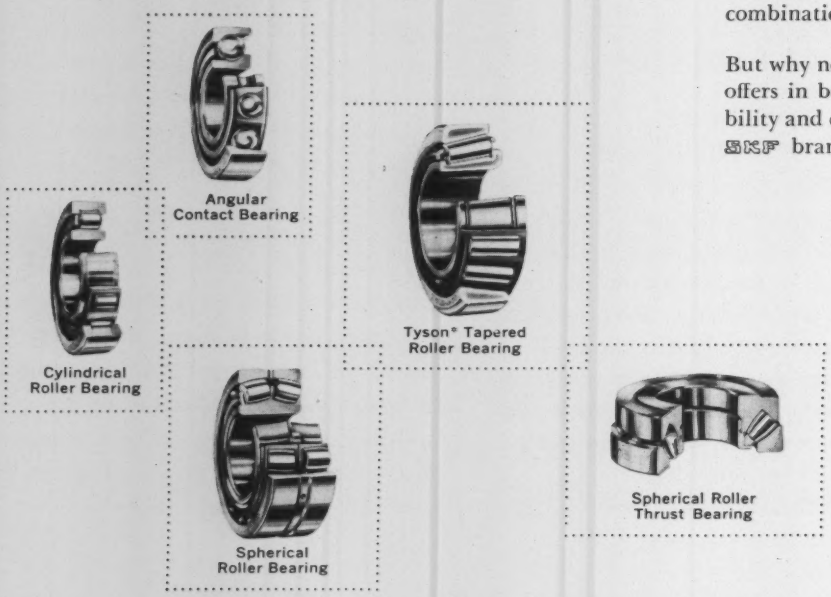

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Ceramic Tools Outperform

A new ceramic cutting tool, cold pressed from aluminum oxide, is offering competition to carbide tools. In recent tests, a leading automaker found that ceramic tools outperformed carbides as much as 600 pct in length of life. Speeds and shock resistance are also substantially higher. The new tools are believed to be the first ceramics suitable for rough and interrupted cuts.

To Adopt Metric System?

Adoption of the metric system of weights and measures is closer to reality. President Eisenhower is urging conversion. If schools and colleges adopted the metric system, the changeover would be accomplished in 10 years. English-speaking nations are the last hold-outs for the yard and the pound.

Reach the "Magic Million"

A "reinforced plastic structure with a strength to weight ratio in excess of 1,000,000 in." is reported feasible. According to the developers, Zenith Plastics Co., a lighter rocket-case can be made of the new plastic for 35 pct less cost than a case made of 220,000 psi steel. Moreover, the case would be free of serious notch sensitivity by virtue of its aligned filaments.

Cold-Bends Magnesium

Now available is the first magnesium cold-bending sheet from coil stock, reports The Dow Metal Products Co. The product is designed for applications which need good cold-bending traits at room temperature—thus eliminating the need for heated dies.

Points Up Good Brazing

Testing the quality of honeycomb sandwich, of any size, is possible with a fast, relatively inexpensive method, according to Magnaflux Corp. The method utilizes special heat-affected fluids as part of the test system. Procedure calls for spraying on the fluid followed by heating from an infra-red source. Because of temperature differentials, the fluid flows to the cover sheet opposite a good braze and coalesces.

Sorts Reactor Metals

Unique device, developed by a General Electric engineer, differentiates between Inconel and stainless steel, Zircaloy-2 and zirconium, and Zircaloy-2 and hafnium. The device, basically a milliammeter, works because the polarity of stainless steel is different from the polarity of Inconel with respect to carbon steel. This also holds for the other metals.

Temper-Resistant Steels

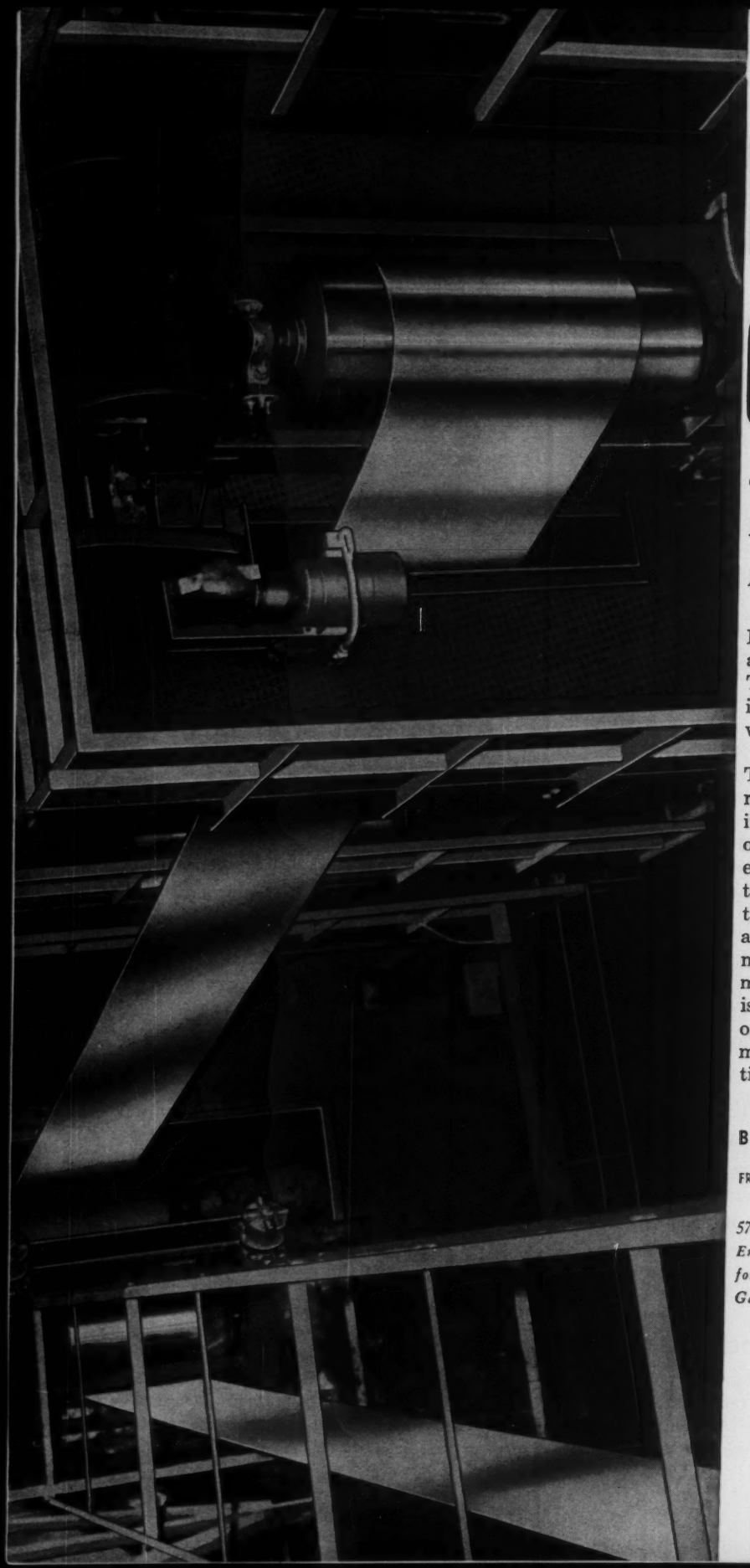
Recent report discusses new temper-resistant steels developed for the U.S.A.F. These high-strength (300,000 psi), medium-carbon (0.30—0.55 pct) steels can be tempered at 1200° to 1300°F to hardness levels nearing 62 Rc. Molybdenum, tungsten, and carbon appear to be the major contributors to temper resistance.

Small Cars Use Zinc

Zinc is playing an important part in the 1960 economy car. Galvanizing is in the forefront of the protective systems used for corrosion resistance. Die cast zinc parts serve in many areas such as heater control and radio bases, instrument housings, and interior trim. And because of the new improved plating systems, die-cast zinc trim has extended blemish-free life.

Handles Emergencies

Immediate contact with key personnel in 30-acre engine plant of a major auto producer is made by means of a portable microwave device. It's clipped to the shirt pocket, signals the man by a buzz or small light. According to reports, the system is especially helpful in emergency maintenance service on big presses and electrical control panels.



LIGHT GAUGES

at High Speeds

Need Rugged

Equipment

Each step toward paper-thin tin plate accentuates the operating problem. Tracking becomes more acute as speeds increase. Coils increase in diameter and weight. Tension becomes more critical.

The equipment must be heavy and rugged. High speeds with lower tensions in annealing, tinning and recoiling can only be accomplished with rugged equipment. Reels, both pay-off and tension, must be heavier to accommodate the bigger coils. New electrical controls are only practical when applied to sturdy mechanical equipment. Only rugged machinery, for which Aetna-Standard is noted, can stand up to 21-turn operation at high speeds with a minimum of strip breakage, down time and maintenance.

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"Second Class Nations"

Sir—In regard to your Nov. 5 editorial and its inference on the steel negotiations, a certain valuable spirit was missing from these negotiations.

Our fore-fathers, when they met to establish the Continental Congress, met in a deadlock of 13 differing views. Benjamin Franklin, that great statesman, advocated that they all unite in prayer to resolve a common cause.

They did so; arose, formed a government by resolving their differences that is still standing secure. Had they not followed his advice and resolved their differences we could well have no United States of America or free enterprise system in which to argue differences of opinion.—Dean Hochestetler, Equipment Service, Nappanee, Ind.

A Question

Sir—I have just read your editorial for Christmas (Dec. 17, 1959) and can not help raising a question.

Did not the inability to secure a steel settlement tend to prove that the original Christmas message was not just a greeting from Above expressing the hope for peace on earth and extending the spirit of good will to humans, but rather that the message was, indeed, a promise to man that there would be "Peace on Earth" for "Men of Good Will" and that the way would be taught to man if he would but learn?

Being a regular reader of your's, I know that you are of good will and will, therefore, enjoy the Peace of Christmas. May it continue through 1960!—H. C. Fell, Administrator, Engineering Library, Scintilla Div., Bendix Aviation Corp., Sidney, N. Y.

▪ **The record will show that the secret talks that brought about the settlement took place during the Christmas holiday period. It's possible that the "spirit of the season" did have a part in reaching eventual agreement.—Ed.**

Special Report

Sir—We receive "Distribution Age" since we are in the material handling business producing equipment for that market.

Our affiliate American Welding & Engineering is a subscriber to your publication "Iron Age."

We note in your issue of Dec. 17, 1959, a splendid article, "A Special Report on Metalworking Capital Appropriations," page 137. If possible, we would appreciate receiving a copy of this special report.—D. C. Callaghan, Vice Pres., American Dockbridge, Inc., Milwaukee, Wis.

▪ **A copy is on the way.—Ed.**

Best Tool

Sir—Your article on Maintenance in the Dec. 10 issue certainly puts knowledge, the best tool of maintenance, on the bottom shelf where everyone can reach it. The article contained information which should materially assist anyone in his job who would take the time to put it to use.

Please send us two copies of this article if they are available.—V. A. Mayer, Asst. Chief Engr., Barry-Wehmiller Machinery Co., St. Louis, Mo.

Sir—Please send me a reprint of the article "Maintenance Dollar."—Raymond B. Murray, Jr., Master Mechanic, Saco-Lowell Gear and Machine Div., Saco-Lowell Shops, Sanford, N. C.

▪ **Reprints have been sent.—Ed.**

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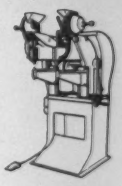
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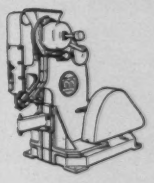
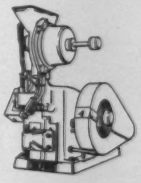
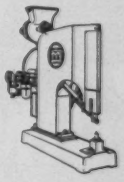

Model 53


Model 52-S-55

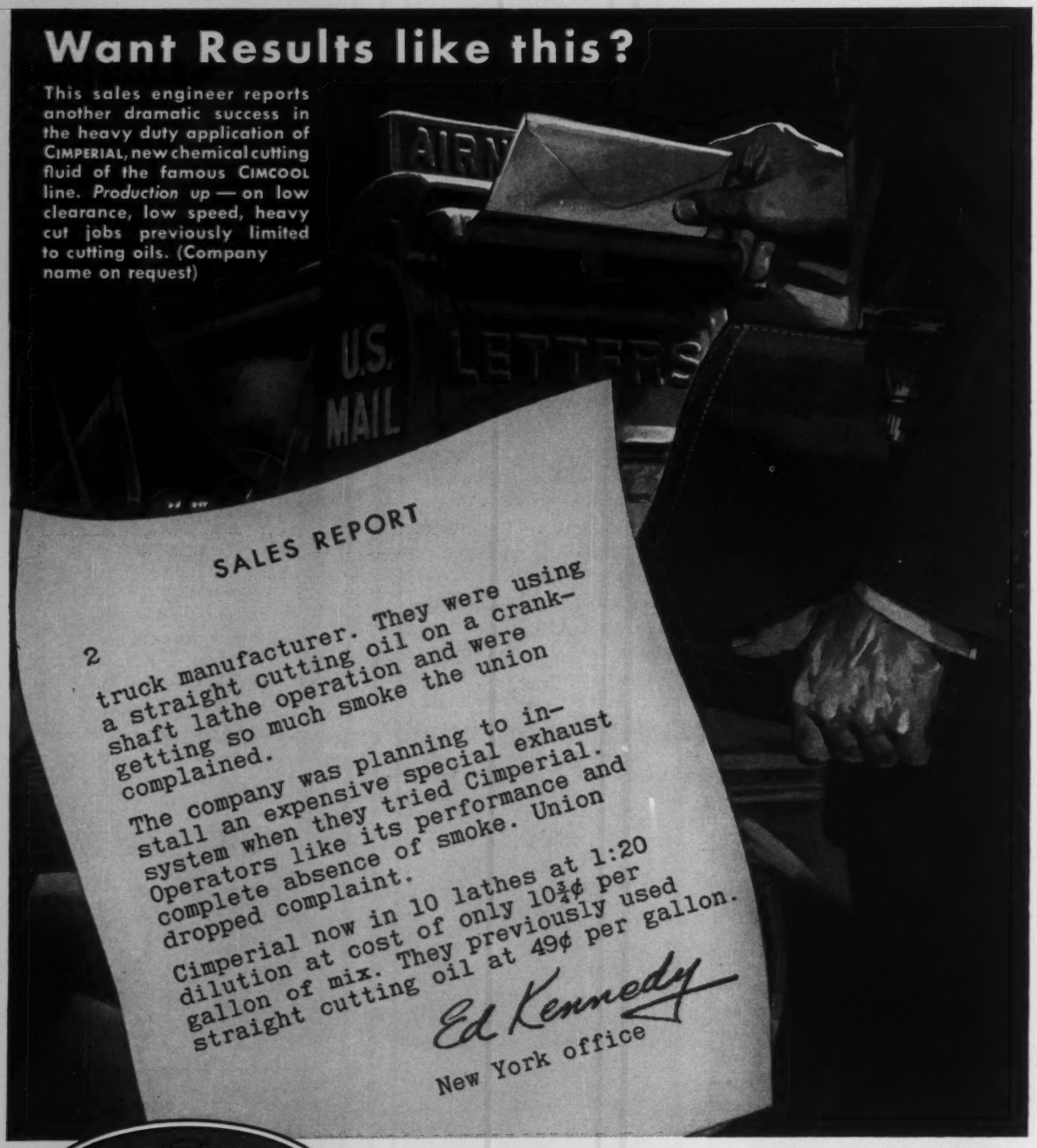

Model 56

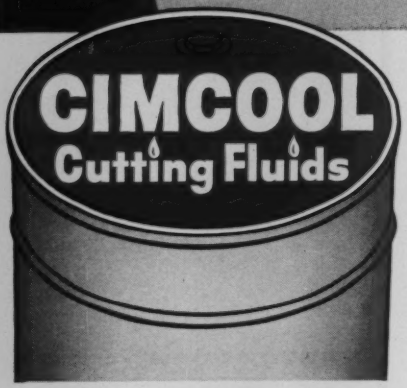
THE MILFORD RIVET & MACHINE CO.

MILFORD, CONNECTICUT • HATBORO, PENNA.
ELYRIA, OHIO • AURORA, ILL. • NORWALK, CALIF.

Want Results like this?

This sales engineer reports another dramatic success in the heavy duty application of CIMPERIAL, new chemical cutting fluid of the famous CIMCOOL line. *Production up* — on low clearance, low speed, heavy cut jobs previously limited to cutting oils. (Company name on request)


U.S. MAIL
SALES REPORT
2
truck manufacturer. They were using a straight cutting oil on a crank-shaft lathe operation and were getting so much smoke the union complained.
The company was planning to install an expensive special exhaust system when they tried Cimperial. Operators like its performance and complete absence of smoke. Union dropped complaint.
Cimperial now in 10 lathes at 1:20 dilution at cost of only 10¾¢ per gallon of mix. They previously used straight cutting oil at 49¢ per gallon.
Ed Kennedy
New York office



FOR 100% OF ALL METAL CUTTING JOBS

Production-proved products of The Cincinnati Milling Machine Co.

CIMCOOL S2 Concentrate—The pink fluid which covers 85% of all metal cutting jobs.
CIMPERIAL — newest in the famous, industry-proven line of CIMCOOL° Cutting Fluids.
CIMPLUS—The transparent grinding fluid which provides exceptional rust control.
CIMCUT Concentrates (AA, NC, SS) — For every job requiring an oil-base cutting fluid.
ALSO—CIMCOOL Tapping Compound—CIMCOOL Bactericide—CIMCOOL Machine Cleaner.

For full information on the complete family of CIMCOOL Cutting Fluids, call your CIMCOOL Distributor. Or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

°Trade Mark Reg. U. S. Pat. Off.

Work and Intuition

We haven't quite settled down yet from the excitement of Tom Campbell's great news beat in breaking the steel settlement story.

As a matter of fact, one of our problems all week had been trying to answer questions such as: How did he do it? Who tipped him off? Who did we pay off? Who paid us off? And many other sillier ones. The only questions we answer with emphasis is that no one paid anyone.

The Big How—So many people have asked the question that we decided to go to the source and put it to the editor-in-chief directly: How did you get the story?

"Well, I'm a strong believer in astrology and the crystal ball," Tom says. "I studied the zodiac and Thursday, before the settlement, the old crystal ball began to clear. Things looked even better Saturday and I talked to a horseplayer friend of mine and he said he'd give odds of nine to one on an agreement.

"Saturday night I dreamed I saw the horseplayer throw a crystal ball at the signs of the Zodiac. I woke up in a cold sweat, knew the agreement was close, and uncovered the typewriter."

Secret Service — In short, just how we got the story will remain a secret.

But what we do know is that it was the result of years of experience covering steel labor; the effect of long-established contacts; painstaking research; hundreds of calls, day and night; tedious, persistent digging and checking; using one bit of information to pry out another, until finally it was all clear.

And, we're sure Tom won't deny it, the intuition of a real reporter.

Let's Communicate

How would you like to pick up a phone during a hectic work day and hear a sweet voice fill you in on company news?

That's what employees at Rockwell Manufacturing Co. are doing. Each day a recorded message (see below) is prepared and all employees have to do is dial and listen.

SWEET TALK: Carol Fraley, of the company's personnel dept., records the message of the day to be transmitted to Rockwell Manufacturing Co. employees over inter-plant telephones.

THE
PENNSYLVANIA PLAN:
100% financing
for your
new plant

Complete financing for Lease-Purchase of a new plant is available in labor-surplus areas of Pennsylvania through combined efforts of lending institutions, non-profit community organizations and the Pennsylvania Industrial Development Authority. Interest as low as 2%, with deferred amortization, can be applied on up to one-half of total plant cost.

100% financing is also available in other areas of the State, provided by community organizations, banks, insurance companies and other sources. You select the community you want. You specify plant construction details or choose one of several plant "shells" now being readied for completion.

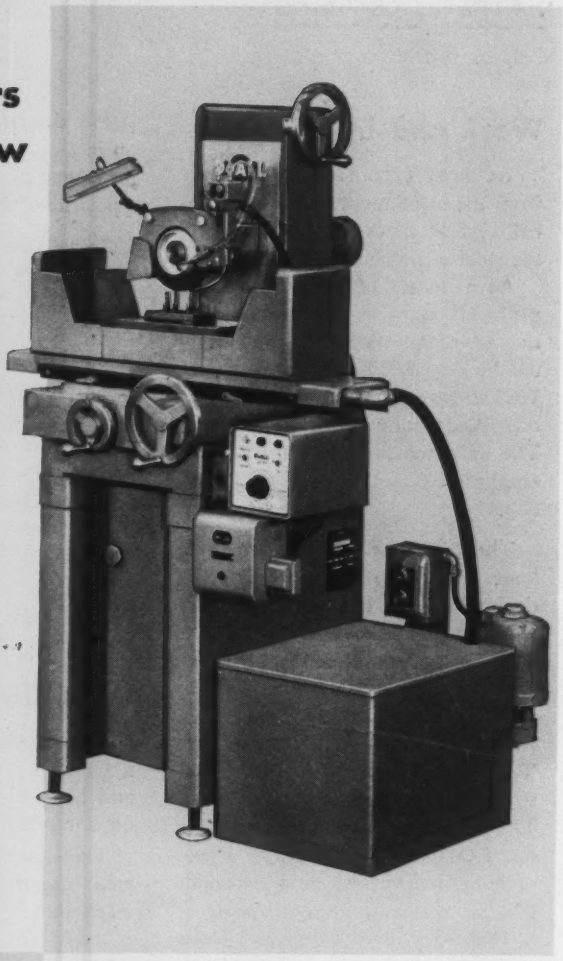
100% Financing at a Glance . . .
Industrial Plant Construction Costs—

Subscribed by local non-profit community sponsored builder-owner corporations.	*20%*
2nd Mortgage Loan, Pennsylvania Industrial Development Authority.	*30%*
1st Mortgage Loan obtained from banks, insurance companies and similar lending institutions.	*50%*
Total financing, secured through local subscriptions and mortgage loans, without cash investment by the manufacturer.	*100%*

For free copy of "Plant Location Services" pamphlet, or for details on 100% financing, write or call:

Pennsylvania Department of Commerce
South Office Building
653 State Street, Harrisburg, Pa.
Phone: CEdar 4-2912

No other manual grinder offers so many advantages as the new DoALL Model DH-612



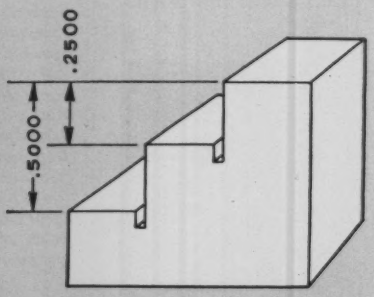
You've never seen a manual surface grinder with such accuracy, convenience and all-around flexibility as the DH-612. Compare it with all the rest—and see.

Accuracy—The DH-612 grinds to closer tolerances than others in its class. It is easy to grind accurately to handwheel calibrations—vertical feed to .0001″ and cross feed to .0002″. The 1 h.p. motorized or belt-driven, permanently lubricated, anti-friction bearing spindle provides steady, precise grinding action. There is no table climb because the saddle ways support the entire work area to the extreme ends of the table travel.

Convenience—Machine height can be adjusted for individual operators. The table drive handwheel can be easily moved for left- or right-hand operation and the wheel handle positioned to suit the operator. A one-shot lubricator oils all moving parts.

Flexibility—A complete line of attachments includes a downfeed handwheel extension to bring all controls within easy reach of a seated operator, also "Cool Grinding" coolant system, and hydraulic table operation. The grinders leave our factory prepared to accept these attachments at any time in the customer's plant.

ACCURACY PROVED



"Hardened tool steel step block"

The DH-612 grinds this step block directly from handwheel calibrations to "tenth" accuracy. This eliminates the grind-and-measure techniques commonly used. This impressive demonstration is one of many performance features that make the versatile DH-612 grinder outstanding.

The DoALL DH-612 Surface Grinder

Table travel: 7″ x 13″
Work height: 0″ to 12½″
Vertical-feed handwheel graduated in tenths
Saddle lock for form and plunge grinding
Full range of optional equipment:
- Zeroing slip rings for cross and downfeed
- Through-the-wheel "Cool Grinding" and flood coolant system
- Hydraulic table drive
- Magnetic chucks, permanent and electric types with DoALL SELECTRON® Rectifiers
- High-speed spindle attachment

SEE IT — TRY IT at your local DoALL STORE

See the new DH-612 grinder. Try its many advanced features. Call your local DoALL Sales-Service Store or write:

GR-28

THIS IS A TYPICAL DoALL STORE

The DoALL Company, Des Plaines, Illinois

COMING EXHIBITS

Plant Maintenance & Engineering Show — Jan. 25-28, Convention Hall, Philadelphia. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Tool Show—April 21-28, Detroit Artillery Armory, Detroit. (American Society of Tool Engineers, 10700 Puritan, Detroit 38.)

Welding Show—April 25-29, Great Western Exhibit Center, Los Angeles. (American Welding Society, Inc., 33 West 39th St., New York 18.)

Southwestern Metal Show — May 9-13, State Fair Park, Automobile Bldg., Dallas, Texas. (American Society for Metals, Metals Park, Novelty, O.)

Design Engineering Show — May 23-26, Coliseum, New York. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Production Engineering Show—Sept. 6-16, Navy Pier, Chicago. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Machine Tool Exposition—Sept. 6-16, International Amphitheatre, Chicago. National Machine Tool Builders Assn., 2139 Wisconsin Ave., Washington 7, D. C.

Iron & Steel Show—Sept. 27-30, Cleveland Public Auditorium, Cleveland, O. (Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22.)

MEETINGS

JANUARY

Industrial Heating Equipment Assn., Inc.—Annual winter meeting, Jan. 18-19, Warwick Hotel, Philadelphia. Association headquarters, 1145 19th St., N. W., Washington, D. C.

Steel Shipping Container Institute, Inc.—Winter meeting, Jan. 19-20,

(Continued on P. 16)

ALABAMA
Birmingham
Hinkle Supply Co., Inc.—FAirfax 2-4541

CALIFORNIA
Los Angeles
Meyer Sheet Metal Mchry. Co.—VAn Dyke 1477
San Francisco
Harron, Rickard & McCone Co.—ATwater 2-2202

GEORGIA
Atlanta
Allison Mchry. Co.—JAckson 4-1741

INDIANA
Indianapolis
E. L. Humston Co., Inc.—WAlnut 5-9691

IOWA
Bonaparte
Corry's Machine & Tool Co.—Phone: 112

KANSAS
Wichita
Ellfeldt Mchry. & Supply Co.—AMherst 7-9773

MASSACHUSETTS
Cambridge
Austin-Hastings Co., Inc.—KIrkland 7-4480

MICHIGAN
Detroit
J. Lee Hackett Co.—TRinity 2-6442

MINNESOTA
Minneapolis
Minnesota Steel & Mchry. Co.—FEderal 3-6273

MISSOURI
Kansas City
Ellfeldt Mchry. & Supply Co.—VIctor 2-5494

NEW YORK
New York
Federal Machinery Corp.—CAnal 6-3022
Triplex Machine Tool Corp.—EMpire 1-1700
H. Weiss & Co.—CAnal 6-4256

NORTH CAROLINA
Greensboro
Armentrout Mchry. Co.—Phone: 4-8218

OHIO
Columbus
Vorys Brothers, Inc.—AXminster 4-4701

OKLAHOMA
Oklahoma City
Hart Industrial Supply Co.—REgent 9-2541
Tulsa
Hart Industrial Supply Co.—LUther 3-2175

OREGON
Portland
Pacific Metal Co.—CApitol 7-0693

PENNSYLVANIA
Philadelphia
Delaware Valley Mchry., Inc.—OLdfield 9-4600
Milton Equipment Co.—WAlnut 2-1734
Pittsburgh
Wm. K. Stamets Co.—ATlantic 1-8091

TEXAS
Dallas
Briggs-Weaver Mchry. Co.—LAkeside 8-0311
Fort Worth
Briggs-Weaver Mchry. Co.—EDison 6-5621
Houston
Mehl Machinery, Inc.—FAirfax 3-1313

WASHINGTON
Seattle
Pacific Metal Co.—MAin 6925

WISCONSIN
Milwaukee
Production Equip. Inc.—GReenfield 6-6075

CANADA

A. R. Williams Machinery Co., Ltd.

ALBERTA
Calgary—Phone: 5-4425
Edmonton—Phone: 24341

BRITISH COLUMBIA
Vancouver—TAtlow 9411
Victoria—Phone: 4-7623

MANITOBA
Winnipeg—SPruce 4-4458

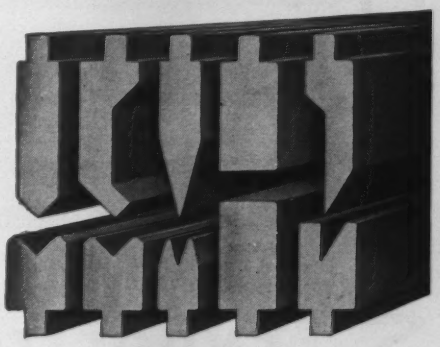
NOVA SCOTIA
Halifax—Phone: 5-4389

ONTARIO
Hamilton—JAckson 9-5388
Ottawa—CEntral 6-3661
Toronto—EMpire 4-2381
Windsor—CLearwater 4-4762

QUEBEC
Montreal—RIverside 8-9381

8925

Off-the-shelf DELIVERY



CHICAGO®
*Induction Hardened** PRESS BRAKE DIES

This organization of local distributors offers immediate delivery on many CHICAGO *induction hardened* press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet in increments of 2 feet.

Stock dies are used for a surprisingly large variety of bending operations. And, with CHICAGO *induction hardened* dies you get bonus performance and increased die life at no extra cost. Remember, these dies can be used in any make or size of standard press brake.

On your needs for press brake dies, call your nearest distributor listed here. With Bulletin D-457 you can order by number. Ask for a copy.

*Induction hardening is a special, high-frequency process used to harden the wear surfaces of CHICAGO dies. Field reports on CHICAGO *induction hardened* dies show up to ten times longer life than conventional press brake dies.

CHICAGO DREIS & KRUMP

Press Brakes, Press Brake Dies
Straight-Side-Type Presses

Hand and Power Bending Brakes
Special Metal-Forming Machines

DREIS & KRUMP
MANUFACTURING CO.
7430 South Loomis Boulevard
Chicago 36, Illinois

MEETINGS

(Continued from P. 15)

St. Regis Hotel, New York. Institute headquarters, 600 Fifth Ave., New York.

Steel Plate Fabricators Assn.—Annual meeting, Jan. 21-22, Roosevelt Hotel, New Orleans, La. Association headquarters, 105 W. Madison St., Chicago.

Truck Trailers Mfrs. Assn.—Annual convention, Jan. 24-27, Hotel del Coronado, Coronado, Calif. Association headquarters, 710 Albee Bldg., Washington, D. C.

Plumbing Brass Institute—Annual meeting, Jan. 25-27, Hollywood Beach Hotel, Hollywood, Fla. Institute headquarters, One Gateway Center, Pittsburgh.

National Assn. of Waste Material Dealers, Inc., The Atlantic Div.—Regional meeting, Jan. 27, Bellevue-Stratford Hotel, Philadelphia, Pa. Association headquarters, 271 Madison Ave., New York 16, N. Y.

Metal Lathe Mfrs. Assn.—Annual meeting, Jan. 27-28, Sheraton-Cleveland, Cleveland. Association headquarters, Engineers Bldg., Cleveland.

Cutting Tool Mfrs. Assn.—Annual meeting, Jan. 28, Harmonic Club, Detroit. Association headquarters, 416 Penobscott Bldg., Detroit.

Assn. of Steel Distributors, Inc.—Convention, Jan. 30 - Feb. 6, El Mirado Hotel, Palm Springs, Calif. Association headquarters, 29 Broadway, New York 6, N. Y.

American Institute of Electrical Engineers—Winter general meeting, Jan. 31-Feb. 5, Hotel Statler, New York. Institute headquarters, 33 W. 39th St., New York 18, N. Y.

G.O.CARLSON Inc.

Mill Inventory of Stainless Steel Plates

Unsheared HRAP Plates

January, 1960

GAUGE	WIDTH	LENGTH
	TYPE 17-4 PH*	
3/16	53	113
1/4	74	80
7/16	40/50	50/60
1	26	73
1-3/8	25	85
1-1/2	12	56
	TYPE 17-7 PH*	
3/16	65/98	108/210
1/4	63/84	145/240
5/16	68	74
7/16	55	64
1/2	60/96	100/120
19/32	48	120
31/32	24	135

*Trademark of Armco Steel Corporation

	TYPE 302	
3/16	84	195
1/4	96	170
5/16	96	280
3/8	84/96	260/350
1/2	96/97	280/310
5/8	96	290
3/4	60	96
1	96	186
1-1/4	62	330
1-1/2	36	150
	TYPE 304	
3/16	80/104	160/300
1/4	72/103	270/300
9/32	80/100	195/240
5/16	84/106	240/340
11/32	60	310
3/8	95/110	240/300
7/16	92	200
1/2	84/96	155/300
9/16	92/96	240/330
5/8	96/100	240/340
11/16	84/96	105/140
3/4	68/96	230/305
13/16	98	282
27/32	96	145
7/8	96/98	184/320
29/32	100	345
15/16	96	210
1	96/98	230/440
1-1/8	96	325
1-1/4	96	302
1-1/2	80/96	144/320
1-3/4	60	92
1-13/16	60	74
2	60/72	70/78
2-1/32	35/52	184/200
2-3/4	98	110
	TYPE 304-L	
3/16	54	192
3/16	72/96	144/290
7/32	60/68	195/243
1/4	72	156
1/4	88/105	145/310
9/32	96/147	138/284
5/16	96	200
11/32	80/106	190
3/8	81/108	170/330
13/32	94	280
7/16	69/106	105/275
17/32	73/100	134/233
1/2	96/108	210/260
9/16	91	260
5/8	75/96	153/320

GAUGE	WIDTH	LENGTH
	TYPE 304-L—CONTINUED	
11/16	96	264
23/32	98	126
3/4	60	172
13/16	94	230
27/32	67	248
7/8	96	278
15/16	75	270
31/32	62/92	168/191
1-1/8	96/98	165/198
1-1/4	96	240
1-1/2	96	240
2	80	205
	TYPE 309	
3/16	48	120
3/16	73/91	105/320
1/4	41/60	112/120
1/4	96	205/220
3/8	96	240
1/2	77/96	155/280
5/8	96	192
11/16	57	82
3/4	28/49	96
1-5/8	68	72
	TYPE 310	
3/16	48	120
3/16	72	104
1/4	72/95	200/240
5/16	63/82	185/240
11/32	96	125
1/2	99	260
2-1/4	25	48
	TYPE 316	
3/16	54	192
3/16	66	198
3/16	72	192
3/16	82/96	170/280
7/32	66/93	110/300
1/4	94/105	160/320
5/16	96	240/300
11/32	86/97	120/240
3/8	86/111	225/300
7/16	78/96	170/360
1/2	96/106	230/300
9/16	74/96	205/290
5/8	96	235
11/16	96	183
3/4	96	280
13/16	77	140
7/8	96/102	236/370
15/16	98	188
31/32	96	276
1	98	242
1-1/8	98	244
1-1/4	65/96	240/260
1-1/2	67	226
2	40	60
2-1/2	70	100
	TYPE 316-L	
3/16	72/90	150/170
7/32	93/110	118/120
1/4	72	156
1/4	72/108	156/300
5/16	70/96	240/295
11/32	92	210
3/8	72/96	200/250
7/16	76/96	122/240
1/2	96	200
17/32	100	135
9/16	96	303
5/8	96	240

GAUGE	WIDTH	LENGTH
	TYPE 316-L—CONTINUED	
11/16	96	138
3/4	84	251
13/16	96	310
7/8	98	214
15/16	96	275
1	96	248
1-1/8	88/98	250/280
1-1/4	98	360
1-1/2	93	276
1-3/4	83	98
2-1/4	63	170
	TYPE 317	
3/16	52	190
1/4	33/61	72/120
5/16	63/83	105/170
3/8	96	135
1/2	67	70
1-5/8	37	66
	TYPE 317-L	
3/16	83/93	150/324
1/4	68/74	235/323
5/16	42	130/309
3/8	88/100	101/109
13/32	100	200
7/16	47	100
1-1/4	32	136
	TYPE 321	
3/16	80	168
3/16	84/91	300/340
1/4	73/94	200/320
5/16	96	288
3/8	96	230
1/2	96	144
9/16	80	159
5/8	96	235
3/4	96	250
7/8	60/96	120/126
1	96	235
1-1/8	70	126
1-1/4	96	220
1-1/2	96	180
1-5/8	72	72
	TYPE 347	
3/16	48	123
3/16	91	135
1/4	72/96	240/300
9/32	94	118
5/16	96	300
11/32	72/98	177/209
3/8	96	240/330
7/16	96	205
15/32	93	128
1/2	94	240
5/8	96	325
11/16	70/100	104/235
3/4	57	120
7/8	63/80	160/190
1	96/98	170/228
1-1/8	52	56
1-1/4	96	240
1-1/2	97	170
1-3/4	55	64
2-3/4	35	50
	TYPE 405	
3/16	77/88	195/235
7/32	77	126
1/4	94	180
5/16	70/96	120/275
3/8	96	354
13/32	86	160

GAUGE	WIDTH	LENGTH
	TYPE 405—CONTINUED	
7/16	60/94	245/255
1/2	61/96	110/174
9/16	97	140
5/8	96	304
3/4	83	167
7/8	96	254
15/16	69	135
1	99	145
1-1/8	97	148
1-1/4	96	208
1-3/8	38	223
1-1/2	84	145
	TYPE 410	
3/16	72/91	190/295
1/4	73/100	275/290
5/16	95/96	173/365
11/32	97	160
3/8	94/98	130/278
7/16	74/96	139/310
1/2	73/98	200/275
19/32	92	350
5/8	96	180
21/32	96	375
3/4	96	199
13/16	104	120
7/8	96	149
1	33	196
1-1/4	98	189
1-5/16	55	170
1-1/2	68	176
1-3/4	60	62
	TYPE 430	
3/16	86/90	190/290
7/32	72/96	115/295
1/4	86/97	200/300
9/32	62	240
5/16	96/99	240/310
3/8	96/97	175/300
7/16	75/98	290/305
1/2	96	210
9/16	87	240
5/8	60/93	120/130
3/4	82	375
7/8	77	260
29/32	97	204
1	98	206
1-1/8	96	220
1-1/4	96	180
1-1/2	96	180
2	48	95
2-9/32	70	119
	TYPE 502-½ Mo (This grade available in plate only. Our base price is 28.25¢.)	
3/16	88/94	235/300
1/4	79/102	225/280
5/16	78/85	169/338
11/32	92	300
3/8	72/96	250/360
7/16	96	138
1/2	96	179
9/16	94	140
5/8	96	240
11/16	66	76
3/4	96	295
7/8	36	230
1	76	96
1-1/4	80	154
1-1/2	72	144

Mill Inventory of Stainless Steel Heads

A.S.M.E. FLANGED AND DISHED

(1½" to 2" straight flange—annealed and pickled after forming for maximum corrosion resistance)

O.D.	GAUGE	304	304-L	316	316-L	347
8-5/8"	3/16"	8	10	2	10	
10"	3/16"	2	18	12	12	3
12"	3/16"	16	6	8	6	
12"	1/4"	2	8	4	12	
14"	3/16"	2	4	10	5	
16"	3/16"	2	9	10	4	
16"	1/4"	5	7	10	5	
18"	3/16"	0	1	13	11	1
18"	1/4"	12	7	11	8	
19"	3/8"	3	2	4	2	
20"	3/16"	7	11	10	1	
24"	3/16"	14	14	4	5	11
24"	1/4"	19	11	8	8	34
24"	5/16"	6	2	18	6	
24"	3/8"	4	4	2	3	
30"	3/16"	22	10	1	0	
30"	1/4"	0	7	9	4	3

O.D.	GAUGE	304	304-L	316	316-L	347
36"	3/16"	7	8	0	2	
36"	1/4"	16	4	8	6	2
36"	5/16"	3	3	2	2	
36"	3/8"	5	2	3	2	
42"	3/16"	9	0	6	4	
42"	1/4"	2	6	8	8	
42"	5/16"	0	0	4	0	
48"	3/16"	2	7	12	7	
48"	1/4"	5	10	9	14	2
48"	5/16"	6	5	8	4	
48"	3/8"	5	6	0	1	
54"	3/16"	2	4	2	4	
54"	1/4"	6	3	1	5	
60"	3/16"	7	4	4	6	
60"	1/4"	2	8	9	2	
60"	5/16"	1	0	0	1	
60"	3/8"	7	3	5	2	

O.D.	GAUGE	304	304-L	316	316-L	347
66"	1/4"	6	6	3	3	
66"	5/16"	0	2	0	0	
72"	1/4"	6	5	6	1	
72"	5/16"	6	2	6	2	
84"	5/16"	0	0	0	2	

STANDARD FLANGED AND DISHED

18"	1/4"	2	4	2	4
24"	3/16"	0	2	3	5
24"	1/4"	5	1	8	2
30"	3/16"	8	4	4	4
30"	1/4"	5	4	2	2
36"	3/16"	12	3	5	2
36"	1/4"	6	3	6	3
42"	3/16"	2	4	5	3
48"	3/16"	2	4	6	4
48"	1/4"	7	4	2	2
54"	3/16"	2	4	2	4

The stainless plates and heads listed above are typical of our current mill inventory; similar sizes are constantly being produced. Limited quantities of PH 15-7 Mo, 309 S, D 319 and D 319-L are on hand. Other grades—305, 309 SCb and 314—can be produced for specific orders. We will cut to your required sizes within 2 to 3 days, faster when required.

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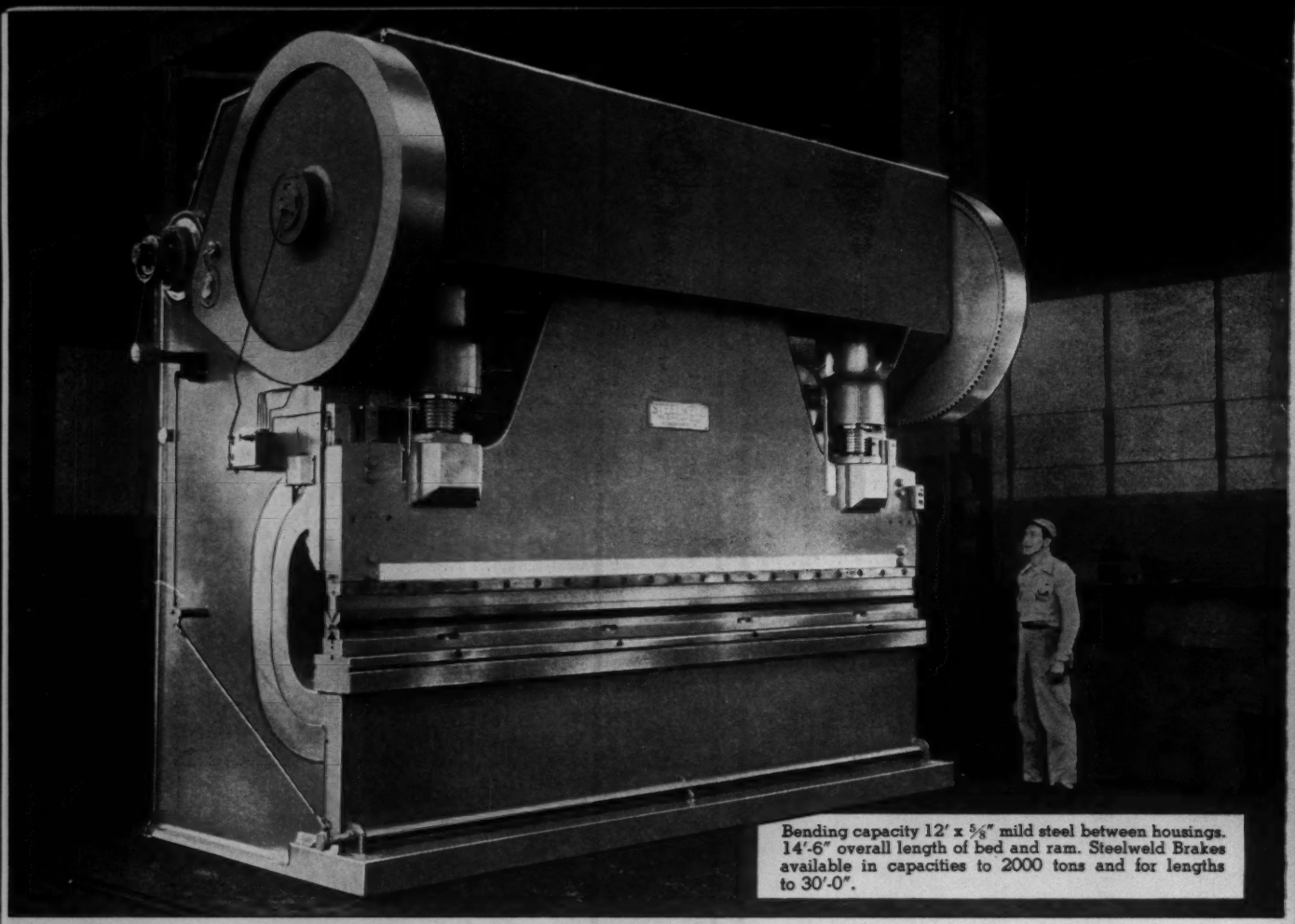


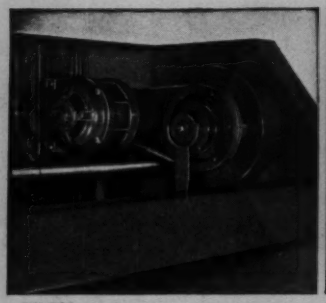
Bending capacity 12′ x 5/8″ mild steel between housings. 14′-6″ overall length of bed and ram. Steelweld Brakes available in capacities to 2000 tons and for lengths to 30′-0″.

BRAKES and SHEARS BUILT

STEELWELD machines are built to withstand the rigors of mass-production high-speed work, as well as meet the needs of jobbing shops requiring frequent set-up changes. They are liberally designed throughout to assure maximum service with minimum maintenance. A wide array of desirable features are provided, some of which are not available elsewhere.

Steelweld Brakes and Shears are easily adapted for special requirements. Our engineers will be glad to work out design changes to speed production, improve safety or bring about other advantages for specific applications.

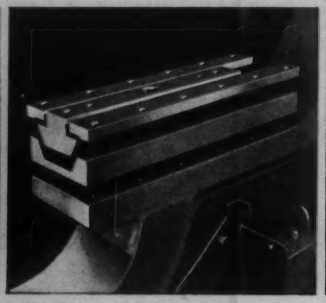
A Few of the Outstanding Press Brake Features



SW-309

Long Life Clutch and Brake

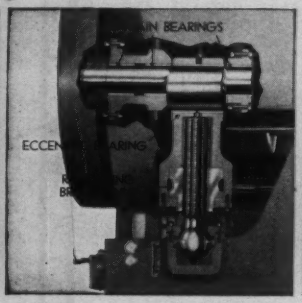
Heavy construction assures long trouble-free life. Clutch unit is duplicate of brake and parts interchangeable. Adjustments easily made without tools.



SW-458

Slides Compensate For Wear Automatically

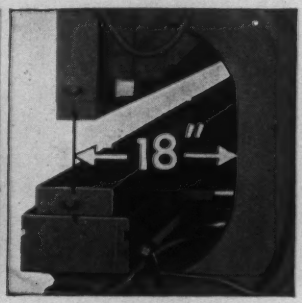
V-shaped slides and guides eliminate loose gibbing. Take up wear automatically. Easily removed and replaced.



SW-304

Six Large Main Bearings

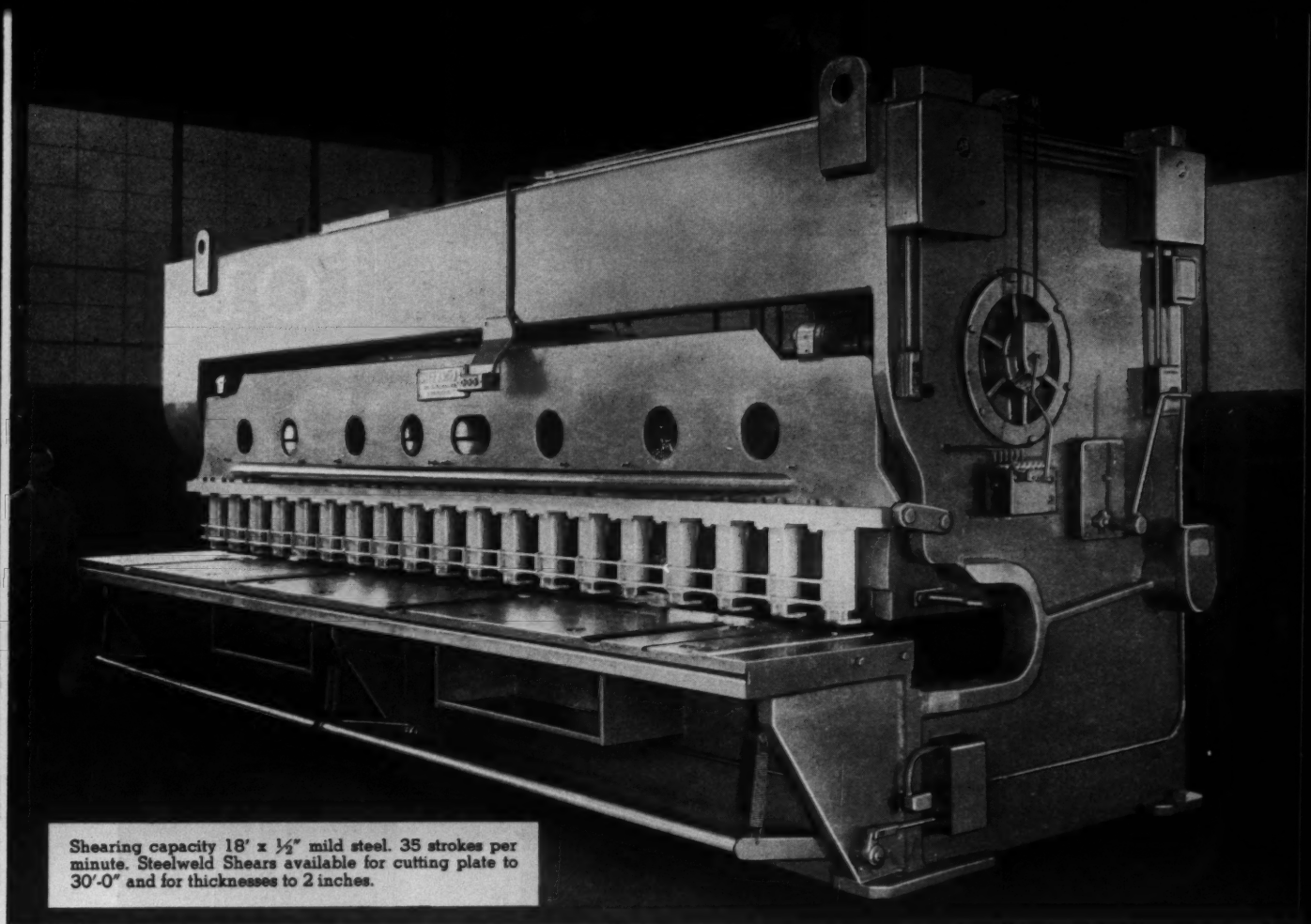
Each of the two eccentric shafts which drive the ram has three heavy bronze bearings. Ram adjustment is made by revolving nut. Screws do not turn; therefor, ball joint wear is reduced.



SW-441

Extra Deep Throat

18-inch throat is standard on all Steelweld Brakes. This permits making bends to 18 inches from edge of plate for full length of dies.



Shearing capacity 18' x ½" mild steel. 35 strokes per minute. Steelweld Shears available for cutting plate to 30'-0" and for thicknesses to 2 inches.

FOR **HEAVY DUTY** SERVICE

Many Important Shear Advantages

1. Pivoted blade operation.
2. No slides or guides to wear.
3. Knife clearance easily adjusted to suit plate thickness.
4. Smooth, sharp accurate cuts.
5. Low rake.
6. Negligible twist, camber and bow in cut pieces.
7. Fast cutting and high production.
8. Easy and simple to operate.
9. Convenient electric foot control.
10. Trouble-free mechanical hold-downs.
11. Easily arranged for squaring, slitting and notching.
12. Convenient, accurate, ball-bearing mounted back gauge.
13. Quiet operating.
14. Designed for safety throughout.
15. Long knife wear between grindings.
16. Knives easily removed and replaced.
17. All-welded one-piece frame with bed integral.

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Catalogs No. 2010 (Brakes) and No. 2011 (Shears) give construction and engineering details. Profusely illustrated.

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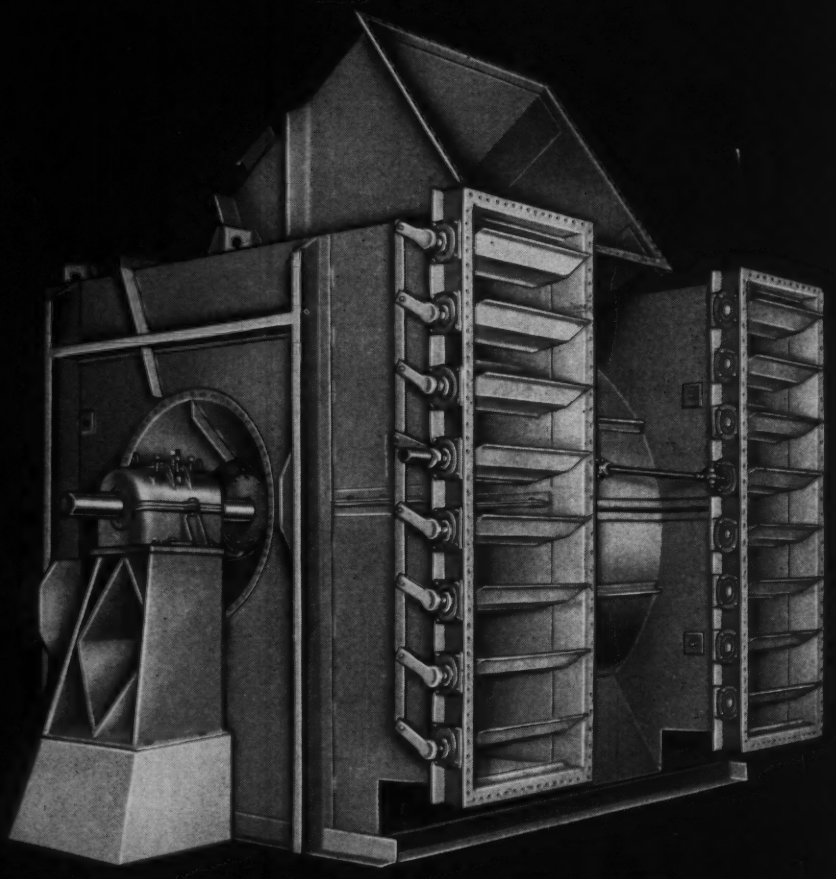

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NEW CARS CONTINUE TO BE SOMETHING to watch in the 1960 economy. The compact jobs are selling better than expected. Furthermore, new ones are ready to roll. Ford, for example, has raised its sales goal for the Falcon from 250,000 to 500,000 or even 600,000. Meanwhile, new lines are being added by both Falcon and Corvair and other compacts will appear later this year.

TIGHT STEEL MARKET WILL LAST at least until the first steel price increases. With some increases assured, steel consumers will try to get all they can before the boosts come. If increases are delayed, it could lead to building inventories higher than would be normal later this year.

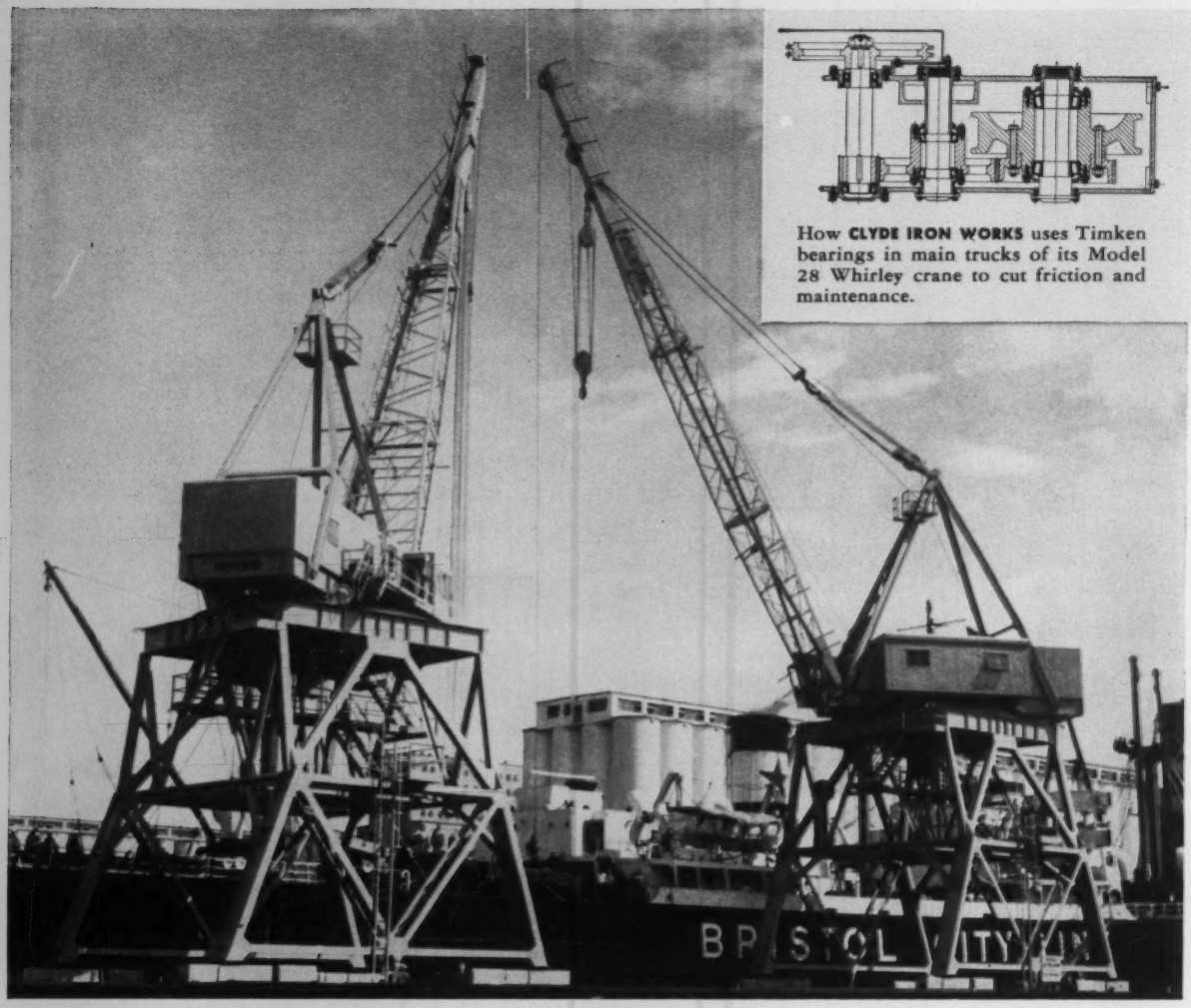
THERE'LL BE MORE SKILLED AND WHITE COLLAR workers in the 1960's as the increased use of electronic and automatic equipment changes the pattern of the work force. The Dept. of Labor also reports the pool of unskilled help will remain stable. There will also be 13.5 million more workers by 1970.

TIGHT MONEY WILL ACT AS A BRAKE on overproduction in 1960. Credit is not in sufficient supply nor on readily-acceptable terms. Borrowing for any purpose--expansion, inventories--will be costly. Highway construction and home building are two areas that will feel the pinch in the months ahead.

A NEW APPROACH TO STEEL PRICING may be tried this year. Competition from imports and other materials may force mills to abandon across-the-board increases and consider products on the basis of individual market conditions. Such a development would work against the long effort of steel men to make each product stand on its own feet profitwise.

MACHINE TOOL BUILDERS CAN EXPECT significant improvement in 1960. A BDSA study indicates that planned expansions and general modernization are factors pointing to increased sales. But little change in the trend to rising imports is expected. One factor in imports is establishment of more outlets here.

ALUMINUM PRODUCERS ARE TURNING out 1 million lb per day for the auto industry alone. This year's cars will require 81 million more lb of aluminum than did the 1959 model run. Average for '60 cars is 56.13 lb. This is an increase of 10.8 pct per car over last year. Corvair, with 103.36 lb, is the leader.



How **CLYDE IRON WORKS** uses Timken bearings in main trucks of its Model 28 Whirley crane to cut friction and maintenance.

68 TIMKEN® bearings give giant cranes more sensitive control, save power and maintenance

FIRST cranes of their type to use Timken® tapered roller bearings in propelling trucks, these Clyde 90-ton Whirleys roll easier with less power. And 20 Timken bearings at other vital points permit sensitive control, cut maintenance because they . . . 1) *Practically eliminate friction.* They're geometrically designed and precision-made to roll true. 2) *Take all loads.* The taper lets Timken bearings take *both* radial and thrust loads. Full-line contact between rollers and races provides extra capacity.

And you get added advantages such as service from graduate engineer salesmen qualified to work with your purchasing, engineering and production people. Service based on the most advanced bearing research and testing facilities in the industry.

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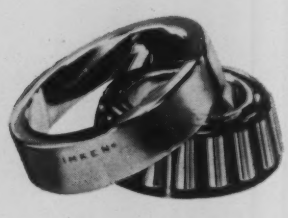

BETTER-NESS rolls on

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tapered roller bearings

Industry Seeks More Generalists To Fill Top Executive Posts

As companies grow larger and more complex they need executives who are familiar with all phases of business.

And they're turning to executive recruiting firms to find the men qualified to fill top management jobs.—By G. G. Carr.

■ If you are executive caliber, with a solid scientific or technical background, you should be able to write your own ticket in 1960. Interviews with executive recruiters put your kind of man at the top of the executive help wanted list.

Reasons are not hard to find. Industry continues to become both bigger and more complex. More and more companies need executives who can understand what it's all about and run things to show a profit at the same time. And it is the combination of talents that is hard to find.

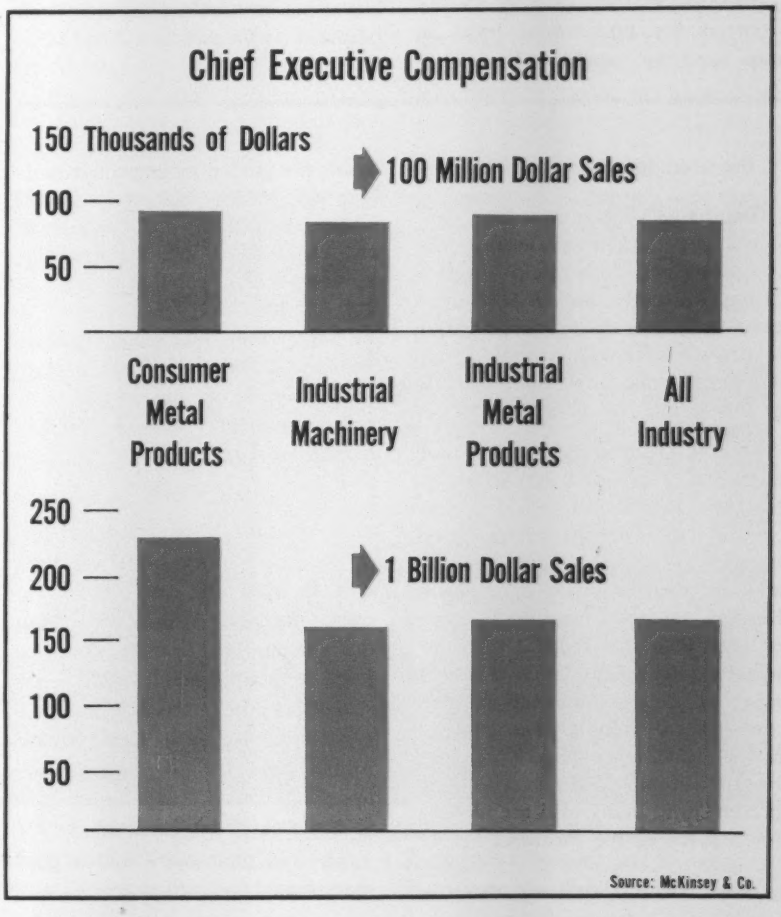
Generalists Wanted — The need for broad-gage men is not restricted to any one field; it's widespread in executive suites. Paul Stafford, Stafford & Hersloff, New York recruiting firm, sums it up: "Business today often wants the generalist. Many firms realize this, but are structured to attract, accommodate and produce the specialist."

Close second to the all-around executive with technical background is the marketing man, reports J. Frank Canny, president, Assn. of Recruiting Executives. Like industry itself, competition is growing in complexity as well as volume. Top sales executives are still prized, but even more desired is the man familiar with all aspects of marketing. Many marketing openings are actually new jobs, created by the spread of the marketing concept throughout industry.

The Money Man—Experienced financial executives are also hotly pursued by the recruiters. Demand here is a direct outgrowth of financing and tax complications, particularly as firms expand, directly or by acquisitions and mergers.

But, suggests William H. Clark Associates, a recruiting firm looking hard for money men, underlying this direct need is often a feeling that the financial executive is equipped to cope with a business in all its phases—another reflection

Metalworking Pays Well— To Get and Hold Its Top Executives



What to Look for in Top Men

There is no "new look" to top executive qualifications, says Sid Boyden, of Boyden Associates, Inc., a leading executive search firm.

Business leadership today calls for the same executive qualities it did a quarter century ago. But, in our modern competitive situation, business leadership now demands the best of these qualities.

What are the qualities?

1. Personality. This includes character, bearing, personal habits and traits, initiative, leadership, and creative thinking.

2. Experience. This means a proven successful record of accomplishment in the same area as the executives' new senior duties.

3. Promotability. A vital factor. Even at the presidential level, a man must be capable of growing with his company, accepting broader responsibilities, planning into the future. Constant growth is imperative. Without it, both executive and company fall behind.

Mr. Boyden points out that there is no room at the top for an "average" man and because a growing number of firms realize this, the trend to search out superior management talent has accelerated.

Mr. Boyden points to his own firm's activity to prove the point. Over the past three years, he and his associates have commenced a new search for a president or general manager on the average of every ten days.

Demand for first-rank executives is universal and it is **critical.** The supply picture is even more serious. Never before have so few men been prepared to fill these top-level positions.

of the need for the generalist.

Dead End?—In a class by themselves are specialists learned in computers and electronic data processing. Presently, only a few firms need such executives, but demand is already larger than supply. And it seems obvious that demand will grow rapidly.

Recruiting consultants report that more and more firms are turning to them for help in filling top vacancies. At the same time, a growing number of executives are quietly making their availability known. Reasons on both sides for seeking outside help are many, often inevitable. Recruiters agree that one frequent cause is failure to develop and reward middle management. Many available executives feel they have reached a dead end with their present firm; many also are looking for a piece of the business.

The Awful Truth—Money remains the golden magnet in attracting and holding executive talent. Other important factors include challenge of the job, opportunities for ownership, reputation of the firm and location.

"Some companies would be very unhappy if they knew what their reputations really are in the business community," comments one recruiter. "And sometimes we have to tell them."

Seek Sunny Shores—Importance of location varies widely. Most-wanted areas are still New York, California and Florida, in about that order. More broadly, coastline jobs are easiest to fill, with North Atlantic leading. Least wanted are predominantly rural areas, Iowa, Kansas and the like. Integration upheavals cause many family men to stay away from the South.

The old philosophy that a good man would go anywhere is now softened by realization of the real business value of an executive's standing in the community. Also, there is recognition that a grown man should know where he can live and work most effectively.

Pay Plus—Most firms are willing to pay the price for good men, recruiters find. But a substantial group are beginning to realize they must overhaul salary schedules for all executives to accommodate the going price for new talent. Arranging the form of compensation to fit an executive's personal financial situation continues an essential in upper-bracket jobs.

A new complication is compensating for deferred pay that will be lost when an executive moves. Growth of "tender traps" like pension plans, profit sharing, and stock options demands that prospective employers be prepared to cover the loss entailed in a job shift.

Contract Conscious—Employers shouldn't feel insulted if the prospective executive asks for a contract. This is a growing trend. Contracts have been common in some fields for years, unheard of in others. However, more executives are now asking for some protection against the risks inherent in a new job.

Some Good Advice—Know what you want, recruiters caution prospective employers. Search firms are plagued by job descriptions that are either so vague they could apparently be filled from the phone book, or so specific that only three men in the country can match them.

Also, be sure you can do what you say. Don't promise something which requires approval by the board until it has been okayed. A surprising number of executives quit new jobs in disgust after a few months because the employer has not lived up to his side of the bargain. Often, this is no fault of the man who did the hiring. But there is nothing like a hidden pitfall to give a new man that quitting feeling.

Ike's Plans Face Uphill Battle

Election-Minded Congress May Spend Budget Surplus

President Eisenhower's hopes for a budget surplus of $4.2 billion may be roadblocked by a free-spending Congress.

Democrats may use it to try and win their way into voters' hearts.—By N. R. Regeimbal.

▪ President Eisenhower may be facing his biggest defeat in the final year of his White House term.

His efforts to wind up his eight years at the country's helm by halting inflationary spending with a huge budget surplus are going to run smack into a free-spending, election-eager Congress under tight Democrat control.

Spenders Ready—In spite of his plea for an end to "wrangling" and cooperation between his GOP administration and Congress, the Democrats are literally licking their chops over the prospect of spending the $4.2 billion surplus for the fiscal year starting this July 1.

One political expert has already called the surplus a "multi-billion-dollar campaign contribution from the Administration to the opposition." The President proposes to use the surplus to reduce the $290 billion national debt, which will result in a saving of $200 million a year in interest charges.

. . . With Lots of Plans—The more likely places the Democrats will use the surplus to try to spend their way into the hearts of voters include:

Lifting the Administration's $41 billion ceiling on defense spending. Democratic presidential hopefuls are already banging away at what they term the sad state of the country's defenses resulting from the Administration's past "budget straitjacket."

Boosting federal aid to education, attempting a new program of loans and grants to chronically depressed areas, and increasing many other welfare programs.

Increasing the approximately $1.5 billion set for space and scientific research. This figure is already twice what was spent this year, and is on top of strictly military research and missile work.

Vetoes May Not Work — The President won't be able to block congressional spending proposals this year as easily as he has in the past. Repeated vetoes and threats of vetoes worked before. But in an election year, with a huge surplus, and with prosperity shining brightly, the veto can't be used as quickly.

President Eisenhower is winding up his term of office with surprising popularity and with a scant handful of major issues on his legislative shopping list. His program, as sketched in last week's State of the Union message to Congress, is highlighted by these requests:

Congress begin serious studies of ways to "protect the public interest in situations of prolonged labor-management stalemate," as in the recent steel strike.

Steps to halt the continuing threat of inflation through fiscal responsibility, reducing government spending, cutting the national debt.

Realistic solution of the farm production-surplus problem, which will help cut government spending.

Increased foreign trade to help slow present balance of payments deficits.

Continued heavy foreign aid spending and technical help to poorer countries, but heavier contributions to help us boost free world development by our allies.

STATE OF UNION: President Eisenhower pleads with a joint session of Congress for thrift, as Vice President Richard M. Nixon, and Speaker of the House Sam Rayburn ponder his remarks.

Steel Never Had a Real Chance—

After the Government Got Into the Act

Looking back, the local practices issue was dynamite. And it exploded.

But when the government stepped in, all the union had to do was sit it out. It did, and won.—By Tom Campbell.

▪ The steel industry never had a chance. Its best friends told it that months ago. So did a lot of the old pro public relations men right in the steel industry. So it is academic to crow about what might have been. A direct fellow in the industry summed it up when he said, "We got the hell beat out of us."

Dave McDonald, the union chief, had most of the breaks. All he had to do was pull the government in, hold on tight and wait it out. Many in steel figured him wrong. He didn't buckle because he had no place to go.

Dynamite in 2-B—It ought to be clear now—as it was to independent management industrial relations people—that the local practice issue was dynamite. Many steel people in the 11-company group thought that the "eight points" were just a bargaining gimmick. But when the strike came off without them being dropped, then those who knew union tactics, worker thinking, and human emotions knew steel would lose sooner or later.

These conjectures have now been proved. But of what use will this be? What is the aftermath of the settlement? Will the former relations be brought back? Will the union buckle down and help management fight the good fight?

Lessons Learned—Everyone says lessons have been learned. That is true. But whether or not those who needed to learn did learn is another matter. Certainly there is no love lost between the union and steel management. Frozen smiles before photographers on both sides are for the birds. There are deep scars. Of course some of these will be healed. But if the same people talk the same way, do the same things, and expect the same unrealistic reactions from each other, then there will be no change.

Steel leaders have been pretty silent outside of their own clubs about the lacing they were getting and what they finally got. Always on radio, TV and in answer to reporters' questions, they had the "party line." But that was by no means what they thought personally. So it can be said, with little chance of real disagreement, that an 11-company coordinating committee that has to report to 11 presidents or chairmen is something out of the "organization man."

Tough in the Clinches—The steel industry had the whole thing pretty well planned except what to do if Mr. McDonald failed to say uncle. When that became apparent, the steel management and their public relations chiefs were on their own.

Lost in the shuffle of the industry's current defeat is the past. It was in 1948 that Mr. B. F. Fairless, U. S. Steel chairman, thought something should be done about inflation. That year there was a "no-strike" clause even if the companies refused an increase. So Mr. Fairless announced a cut in steel prices. It was not long before the price cut was restored and a wage increase was granted because the experiment failed.

Nixon's Role—It has been said

Steel Settlement for the Record

Wages—A 7¢ per hour increase next Dec. 1, an equal amount Oct. 1, 1961. A 0.2¢ increment hourly increase in the spread between the some 30 job classifications to compensate for skills. Similar boost Oct. 1, 1961.

Insurance—Companies pay full cost of life insurance, sickness, accident benefits, hospitalization and surgical insurance. Plus increases in coverage. This gives workers an immediate increase in take-home pay.

Pensions—Minimum benefit increased for each future year of service to $2.60 a month. Companies to pay special retirement payment equal to 13 weeks of vacation pay when worker retires. Other retirement provisions.

SUB—Details to be negotiated, but companies agree to restore the 2¢ per hour "IOU's" canceled when strike began last July.

Local Working Conditions—Labor management committee headed by neutral chairman will study clause and make recommendations, not binding, by Nov. 30.

Study Committee—Human relations research committee will be set up to study problems concerning ways to adjust wages, job classifications, incentives, seniority, and other problems.

that if Vice-President Nixon had not come into this picture things might have been different. They would have, but no one knows how different. Mr. McDonald could have been clobbered or it could have been the other way around. But that too is academic because it wasn't Mr. Nixon per se who came into the picture; it was the government, with him as a symbol.

The bitter lesson is that until labor monopoly is broken and until politicians change their tactics, it is hard to see how labor can ever lose —or management ever win.

Looking Ahead—As to the future: There will be a real effort to get along with each other in steel management and labor. Whether Mr. McDonald will get going with management on a joint program of understanding and cooperation remains to be seen. If he doesn't and if management doesn't try to initiate such a move, next contract time could be worse than this one was.

Arthur J. Goldberg, union counsel, the fellow who always frustrates the steel negotiators by his sharp and clever bargaining, is on record for a better understanding. So is Mr. Meany, head of the AFL-CIO. The best that can be seen is that some effort will be made to prevent such a steel strike and hassle again. But realistically, the industry is back where it started.

Union's Obligation—There is no reason to believe that the steel negotiating team will change. The companies it represents are satisfied with the job and no blame has been attached to it. They are pretty much like lawyers hired by the plaintiff (or the defense) to do the best they can within the realm of the principal's pocketbook and beliefs. The only exception to this may be the estrangement between Messrs. Cooper and McDonald.

Sooner or later the union must—because of personal security alone—start taking a look at the steel industry's problems. Possible preview is in the way the steel side negotiated the contract after it had the

THE VICTORS? Vice President Nixon and USWA president McDonald reflect mutual pleasure meeting socially after settlement. Mr. Nixon gained politically by the agreement, Mr. McDonald can't be called a loser.

39¢ to play with. (41¢ for firms which have to do more SUB funding.)

The Trading—A breakdown of the wage package cost to the steel firms shows that Mr. McDonald had to give a few things. It is true that he got the benefit of the 4¢ an hour cost-of-living which he might have won in court had the case not been postponed. This 4¢ was traded away into the overall package and enabled the union to get an immediate increase in take-home pay running from 6¢ to 9¢ an hour. This came from the company picking up the tab on the new insurance package.

Another sharp trade was management's insistence that its 38¢ be protected. Thus, if insurance goes up too fast and too far, it must be made up from the cost-of-living provision of the new contract.

Breakdown — Here is the latest breakdown in cents per hour of the 39¢ package in terms of total cost in the 10-month period to the major steel firms:

Insurance	7.04¢
Pensions	3.60¢
1st Wage Inc.	11.00¢
2nd Wage Inc.	10.16¢
*Cost of Liv.	7.20¢
Total	39.00¢

* Note: Cost of living can be used in paying for excess insurance cost. Wage increase cost includes base and increment increase and is average. All above figures include total cost to the steel firms.

Rounding It Up—By getting a Dec. 1 date for the first wage increase, some heat was taken off the steel firms. But that doesn't change the total cost of the package, which remains at 39¢ for the 30-month period. And it should be remembered that costs start right away because the companies supply from 6¢ to 9¢ an hour for the part of insurance which formerly was paid by the employees.

All will be serene until the "next time." And prices will have to be raised to make up some of this cost. (See Editorial, P. 7.)

Can U. S. Close Missile Gap?

With a Little More Push, USSR Can Be Caught

With a doubled budget and many big projects in the works, U. S. rocket men can make sudden gains this year.

Bigger, more powerful engines, the key to the race, are on the way.—By K. W. Bennett.

▪ The U. S. space program doubled its thrust and moved into the big money area as the Federal budget aimed at $1.5 billion for fiscal 1961 space research; $800 million was spent in the current fiscal year.

National Aeronautical and Space director, Dr. T. Keith Glennan, provided more push, when he indicated the U. S. could match present Russian rocket engines in 18 months to two years. Top U. S. scientists had earlier indicated Russian rocket engines are 2 to 10 years beyond U. S. efforts.

Announcement Coming—NASA has not confirmed the report. But rocket program sources hint the U. S. will announce plans for a hydrogen engine equal to present Russian equipment in the next three to four months. It could mean the "missile gap" is beginning to close.

What is the missile gap? Russian space probes get an initial thrust from two 300,000-lb thrust engines; a 600,000-lb push into space. The biggest operational U. S. engines are about half that big, rated at 150,000 lb thrust. These are engines of the type that power the Atlas ICBM. The Russian engines are believed to employ conventional fuels—liquid oxygen and light oils.

What's Coming—NASA is keenly aware of the difference. Deputy director H. E. Howell, Jr., in a recent report, indicated the USSR has a clear lead in "vehicle technology". He pointed out that the bigger rockets allowed the USSR to explore space more quickly and thoroughly, and to increase their lead in space-flight technology at an even faster rate.

It's now reported that we'll leapfrog past the building of a 300,000-lb thrust engine using conventional fuel, to a hydrogen engine of equivalent thrust. Hydrogen is rated the top chemical fuel. When hydrogen is obsolete, it's believed the next step would be an atomic engine.

Such an engine is at the static testing stage. Even then, the hydrogen handling techniques gained by metalworkers in constructing hydrogen-fueled rockets would be useful. It's believed an atomic engine would use liquid hydrogen as a coolant-propulsive agent.

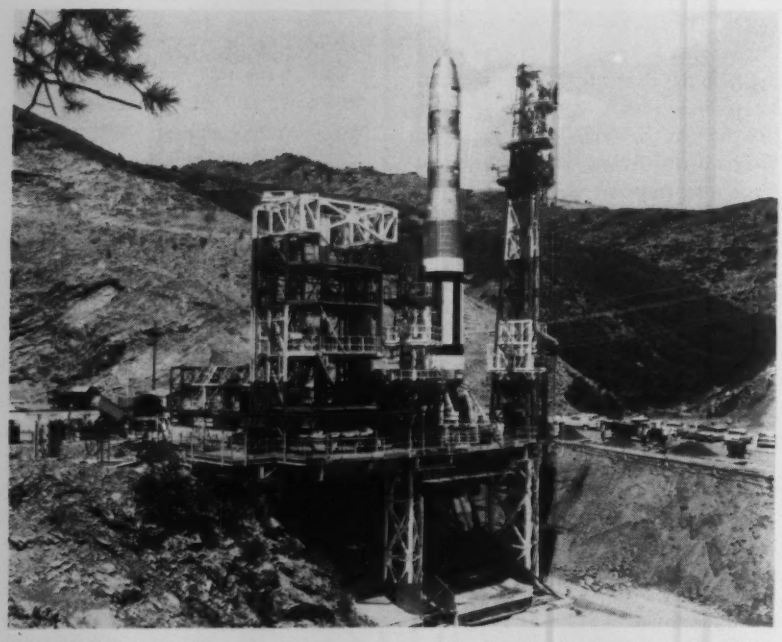
Developments Under Way—The evidence pointing to a U. S. high-thrust hydrogen engine is beginning to grow.

Pratt and Whitney completed testing a 15,000-lb hydrogen engine in December. The same firm, using $8 million of its own funds, completed test stands capable of mounting a 300,000-lb thrust engine recently.

Aerojet General tested an engine setup, hydrogen powered, at 100,000-lb thrust.

Rocketdyne Div. of North American Aviation has pumped hydrogen fuel, with what it believes is the biggest hydrogen pump in the business, at a rate sufficient to power a 300,000-lb thrust engine. Pratt and Whitney and Aerojet General researchers have indicated they see no insoluble problems in building larger engines.

Test Fires—A 300,000-lb thrust



STANDBY: Air Force's Titan stands poised on Martin-Denver's static test stand. Powerful as it is, its thrust will be small compared with projects under way that will push missiles (and men?) into space.

engine designed for conventional fuels has already been developed by Rocketdyne. Thus far, it is standing by. According to a Rocketdyne spokesman, the engine is fully tested; and could be put into manufacture. This is the E-1, rated at 300,000 to 500,000 lbs thrust.

But betting is on the hydrogen engine. In theory, a two-thrust chamber hydrogen rocket could develop as much power as a three-thrust chamber conventional rocket. Liquid hydrogen generates 30-40 pct more power than conventional fuel.

More Steps — The 300,000-lb thrust hydrogen engine would represent a firm step forward. It would not be our biggest engine. If targeted for late 1961, it would have Saturn hot on its heels.

Saturn, a cluster of eight conventional engines aggregating 1.5 million lbs thrust, is a Rocketdyne project and test firing of its engines will begin late this spring, according to NASA. Official flight is scheduled for late 1962 or early 1963. The unit can carry six tons of equipment into space.

By 1963, Rocketdyne's big F-1 should be ready. This is a single-thrust chamber with a 1.5 million-lb thrust. It burns conventional fuel. A test run of the thrust chamber has already produced thrusts exceeding 1 million lb. Sometime between 1965 and 1970, four F-1's will be clustered to produce NOVA, a 6 million-lb thrust rocket for deep space exploration.

Meantime, the hydrogen rocket is the strong contender. Techniques for handling liquid hydrogen (423° F) are much simpler than first appeared, according to rocket engine technologists. And the fuel has more power, and less weight, than other fuels. Asked if Russian rocket designers are using the fuel, U. S. rocket men believe they are capable of employing it, if they don't already do so. The U. S. won't bounce ahead, but rocket men believe we can begin closing the gap.

DR. R. F. MEHL: Scientific ambassador of the American steel industry.

Searching Europe For New Ideas

▪ On Dec. 28, Dr. R. F. Mehl arrived in Zurich, Switzerland. He began setting up headquarters for scientific liaison between Europe's top technical men and United States Steel Corp.

Longtime educator (Carnegie Tech—1932 to 1959) and internationally known metallurgist, Dr. Mehl is operating on a broad commission. There is no detail itinerary. He will mosey around the continent, looking for new knowledge wherever it develops.

Exchange Sought — The search will take Dr. Mehl to some production facilities, but the emphasis will be on universities, research institutes and other centers of basic investigation.

Information will be funneled back to U. S. Steel's research group regularly. Also, efforts will be made to promote a more active exchange of scientific people between this country and Europe.

Dr. Mehl's appointment gives the American steel industry its first permanent scientific embassy in Europe. Behind the move:

1. Europe has shown itself a vital source of new scientific ideas;

2. American companies now recognize the need for close running contacts in taking full advantage of world progress.

Part of a Trend—U. S. Steel considers its project more a part of a general trend than the result of any specific development.

"Science is becoming more international," says Dr. James B. Austin, administrative vice president, research, U.S. Steel. "Many American firms now have this type liaison."

European Stimulation — In the last few years U. S. steelmakers have drawn heavily on Europe for new methods. Basic oxygen steelmaking and vacuum degassing came to this country from Europe.

Automakers Use More Aluminum

Compact Cars Help Boost the Average in a 1960 Model

Aluminum sales to U. S. automakers will maintain steady growth this year.

Alcoa figures Detroit will use about 364 million lb, about 81 million lb more than in 1959.

▪ No matter how you look at it, the auto industry is a better-than-ever market for aluminum.

One way the Aluminum Co. of America puts it: Automakers now require one million lb of aluminum daily.

The closeup picture: The average 1960 car will have about 56.13 lb of aluminum, estimates Alcoa, up 10.8 pct over the 1959's.

The Big Picture — Figuring the auto industry's own estimate of 6.5 million cars this year, automakers will need a total of 364,841,000 lb of aluminum in this model year. This is about 81 million lb more than the previous model. Alcoa says only about half of this increase is due to upped auto production. The rest goes to new uses in specific models.

The new popularity of U. S. small cars will help, believes Alcoa. The five—Corvair, Falcon, Valiant, Lark, Rambler—will use close to 90 million lb of aluminum and average 58.26 lb per car, more than the total industry average.

Big in a Little Way—Just the three new compact cars—Corvair, Falcon and Valiant—look even better to aluminum people. Their average is 73 lb per car, a fat 17 lb over the industry average. Leading this parade is General Motors' Corvair with the first mass-produced aluminum engine in a U. S. car. This bumps the Corvair's average to 103.36 lb per car.

There's even more to this growing success story. None of the averages, nor the total industry calculations, figure aluminum used for spare parts (about six lb per car), alloyed in zinc die castings for cars, used to deoxidize the steel used in cars, and coatings for mufflers. Add these and the total industry requirement of aluminum in 1960 easily tops 415 million lb.

For Paint Also—And to gild the lily, about half of the U. S. 1960 cars will be coated with enamel containing substantial quantities of aluminum powder.

In the figuring, Alcoa tallied the growth of aluminum used in autos for the past few years. It's a source of joy for all aluminum men. As recently as 1954, the average U. S. car contained only 25 lb of aluminum—less than half the 1960 average.

Since that year, the average has increased just about five lb per year, give-or-take a little.

More Than Skin Deep — While aluminum sells to many of its other markets because of its appearance, or weathering qualities when anodized, the use of aluminum for hardware and trim on cars is actually leveling off.

Aluminum trim and hardware is now 15 pct of the auto market (for aluminum), averaging about 8.42 lb per car. But 1959 models averaged 10.18 lb per car, reports Alcoa. Then, over 20 pct of aluminum sold for automaking was used for decorative parts.

Getting Under the Hood—Aluminum for engine parts is more than picking up the difference. The Corvair's all-aluminum engine will help boost the average per car for this application to over 20.5 lb in 1960 from 15.75 lb in 1959. Last year, aluminum engine parts were 31 pct of the total auto market for aluminum. This year the figure is estimated at 36.7 pct.

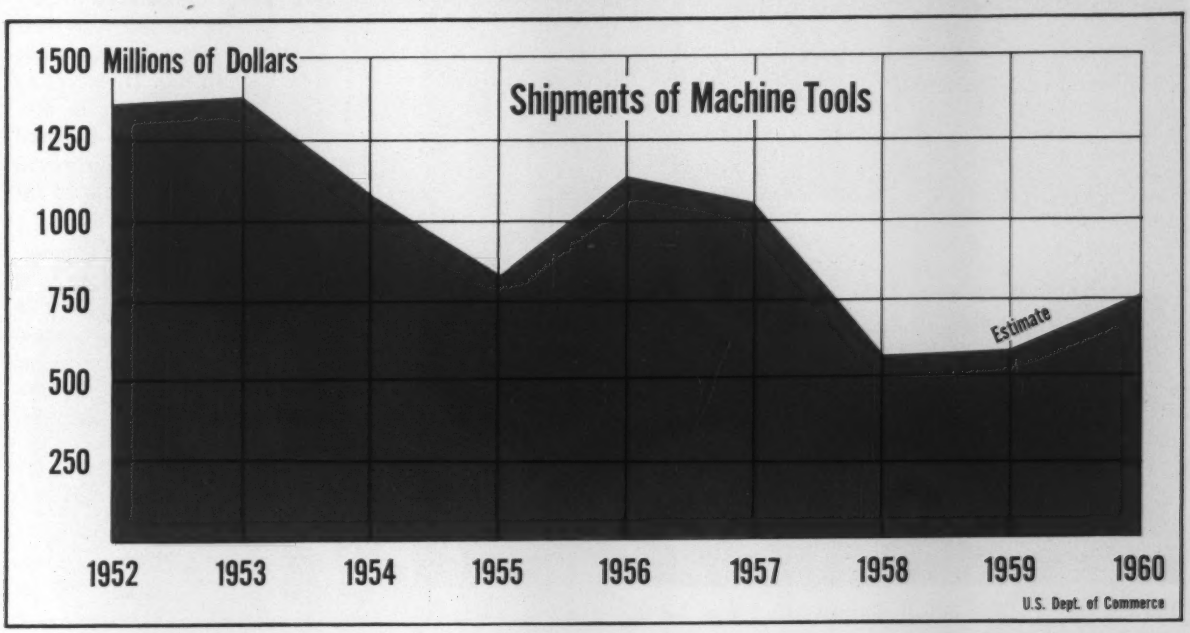
Company - by - company, aluminum's deeper penetration of auto markets is not across the board. The average Ford Motor Co. car will use 14.2 pct less aluminum in 1960 than in 1959. But General Motors' cars will average 29.5 pct more, and Chrysler Corp. cars will use 23.3 pct more.

Growth of Aluminum in Autos

CAR PART	1960		1958	
	Pounds Per Car	% Total	Pounds Per Car	% Total
Engine	20.60	36.7	15.51	32.8
Transmission	18.41	32.8	15.62	33.0
Hardware & Trim	8.42	15.0	8.95	18.9
Body	1.80	3.2	1.94	4.1
Electrical	2.47	4.4	1.94	4.1
Brakes (incl. power)	2.02	3.6	1.51	3.2
Steering (incl. power)	0.78	1.4	1.09	2.3
Air Conditioning & Heating	1.23	2.2	.64	1.4
Air Suspension	0.17	0.3	.11	.2
Instruments	0.06	0.1	.02	—
Miscellaneous	0.17	0.3	—	—
Total	56.13	100.0	47.33	100.0

SOURCE: Aluminum Company of America, Commercial Research Division.

Machine Tool Shipments Reverse Downtrend



Machine Tool Sales to Rise

Commerce Dept. looks for machine tool shipments to increase 30 pct over 1959.

But the industry will still be at the edge of profitable operations, and foreign competition will continue to increase.

▪ Machine tool shipments have been on the rise since October, 1958, and the uptrend should continue into 1960, according to the Business and Defense Services Administration, U. S. Dept. of Commerce.

In an appraisal of the metalworking equipment market, BDSA looks for machine tool shipments to total $760 million in 1960, a 30 pct increase over 1959 sales of about $585 million. For the past nine years the ratio between cutting and forming type machine tool shipments has been fairly constant at about 3 to 1.

A progressive buildup of machine tool shipments began in 1950 to meet the needs of the Korean Emergency. The peak was reached in 1953 when shipments totaled $1.4 billion, the report says. From 1954 on there was an almost continuous decline until industry shipments reached a lowpoint of $571 million in 1958.

Favorable Factors—Several factors are cited as pointing to improved machine tool sales this year: Planned expansion in many industrial segments, especially transportation and construction, and the general modernization of production equipment to increase output with lower production costs.

General economic conditions at the beginning of this year are more favorable than those prevailing at the beginning of 1959. Present average backlogs are now in excess of five months.

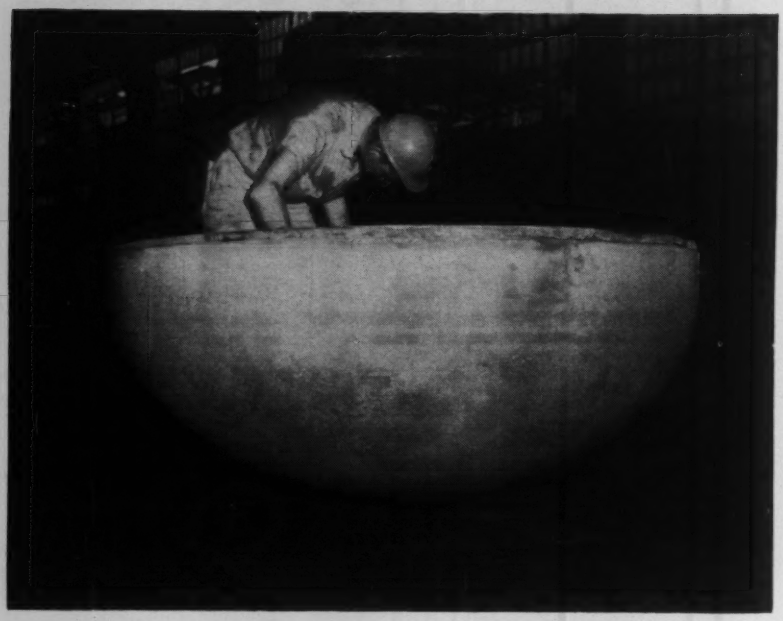
More Orders Coming—In recent weeks, the auto industry has placed substantial orders with segments of the machine tool industry. And additional orders for increased automation and for the production of 1961 model cars are expected in coming months.

BDSA says that a high percentage of the more than 2.25 million machine tools in American industries can be considered obsolete.

Enough for Profit?—If industry plans to emphasize a program of machine tool replacement and modernization should come off, then prospects are good that sales will increase even more than predicted.

But not all factors that will affect the machine tool market in 1960 are on the plus side. For one thing, while the outlook calls for shipments to reach $760 million this year, BDSA's report points out that annual shipments of $775 million are considered the lowest level at which the industry can profitably operate.

For the Minuteman: A New Nose



300 LB NOSE: This 300 lb stainless steel nose for the Minuteman missile, now in the development stage, is pack pressed at the Luken Steel Co. plant at Coatesville, Pa. It will become a dome for the missile's rocket motor.

Depreciation Policies Called "Outmoded"

The Senate Small Business Committee has charged that the nation's economic growth is being retarded by outmoded Treasury Dept. tax depreciation policies.

In a report submitted to the Senate the committee points to inflation and technological obsolescence of production equipment as making depression-born depreciation policies inadequate now.

Recommendations—Small firms, because of capital limitations, are particularly hard hit by current depreciation policies, the report says.

The committee urges Congress to: Shorten the period for depreciating property. Permit greater depreciation in years immediately following purchase of property. Depreciate property on bases other than cost to reflect the inflation factor.

As one specific approach to the problem, the report suggests adoption of triple-declining-balance depreciation on equipment and machinery having a life of five years or more. It also asks for the replacement of Bulletin F with a class system for determining useful lives of property.

Personal Property—Another recommendation, conditional upon enough liberalization of other depreciation policies, calls for the elimination of capital gains treatment for personal property used in a trade or business.

The report's final recommendation calls for further consideration of bills to give depreciation methods now available for purchasers of new equipment to buyers of used equipment, and to allow tax deductions for earnings plowed back into small businesses.

Unemployment Caused By Strikes Was Low

Despite the large number of persons unemployed because of the long steel strike, unemployment due to work stoppages in 1959 was among the lowest in the post-war period.

The Dept. of Labor says 1,850,000 persons were out last year. This was lower than in any year since the end of World War II, excepting 1954 and 1957, according to preliminary statistics. Five-hundred thousand of those directly involved were in basic steel and related industries.

Extended stoppages in nonferrous mining also contributed to the year's total. Total man-days lost in 1959 amounted to about seven-tenths of one pct of the estimated working time of all workers in nonfarm establishments, excluding government.

Iron Range Survey

The Federal Small Business Administration will conduct an industrial survey of Minnesota's iron range from Jan. 18 through Jan. 23.

Means of expanding the economic base of the range will be studied. The SBA team will concentrate on an anlysis of existing range industries.

The study was proposed by Senator Hubert Humphrey, (D., Minn.)

Kaiser to Build Ships

Kaiser Industries Corp. will reenter the shipbuilding field in the near future.

The company announced that negotiations have been completed for the acquisition of the business and physical assets of the shipbuilding facility formerly operated by National Steel and Shipbuilding Corp., San Diego.

A new corporation, National Steel and Shipbuilding Co., has been organized. It is jointly owned by the Henry J. Kaiser Co., Morrison-Knudsen Co., Macco Corp., and F. E. Young Construction Co.

The newly formed corporation will continue the activities of its predecessor, in the fields of shipbuilding, steel fabrication and aircraft and missile parts manufacture.

Call on Bethlehem for the best in bars. Steel bars of every description. Standard and special bars. Always top quality.

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CARBON
TOOL STEEL
HOT-ROLLED
SPECIAL SECTIONS
LEADED CARBON AND ALLOY
COLD-DRAWN ALLOY AND TOOL STEEL

rounds • cut lengths or coils • annealed • specialty tool • file steel • squares • hot-work tool steel • pickled and limed or oiled • spheroidize annealed • hollow drill steel • special quality • oil-hardening • rough turned • killed steel • electric furnace steel • reinforcing bars • water-hardening carbon tool steel • rimmed steel • half-rounds • merchant quality • open-hearth crucible analysis steels • AISI standard analyses, grades, specifications • spring steel • rephosphorized • special analyses • aircraft-quality steel • channeller and broaching steel • hollow bar • bearing quality • flats • special hardenability-tested • centerless ground • controlled grain structure and size • bar-size shapes • AISI standard sections • mayari R low alloy, high strength steel • planish finish • lammellar pearlitic annealed • round-cornered squares • open hearth steel • semi-finished • die-casting die steel • grooved spring-steel flats • extrusion die steel • close-tolerance alloy rounds • angles • shock-resisting • special etch tested • axle-shaft quality • capped steel • quenched and drawn • cold-heading quality • nitriding steel • air-hardening • carbon-vanadium tool steels • ground and polished • hexagons • rifle barrel, gun, shell, and shot qualities • brake die steel • normalized • half-ovals • open hearth bessemer-equivalent steel • extensometer tested • high-speed tool steel • semi-killed steel • turned and ground • mining & quarrying steel • octagons • tool and die steels • rerolling quality • cold-heading quality • resulfurized • quality controlled • leaded steel • tempered

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BETHLEHEM STEEL

BETHLEHEM STEEL

There's a Bethlehem steel bar for every purpose

SPECIAL QUALITY FOR FORGING

Good sound steel throughout—that's the Bethlehem forging-quality bar as used here in this all-steel hatchet. Its uniformity is the result of careful quality control, and is the secret behind thousands of successful products, carbon, alloy, and tool steel alike. Look into Bethlehem bars for forgings. They're always available direct from Bethlehem, or ordered through your local steel service center.

One of the world's largest bar manufacturers

Bethlehem produces hundreds of thousands of tons of steel bars every year. Hot-rolled carbon bars to any analysis in standard sections, special sections, and bar-size shapes. Hot-rolled and cold-drawn alloy bars in standard and special analyses and sections. Tool steels in standard and special grades. Leaded carbon and alloy steels.

We can produce the exact bar of your specifications. Our metallurgical staff will even help you select the bar most likely to succeed in your product, and will assist you in determining the most appropriate processing and finishing operations it should receive.

Next time you have a steel bar problem, let us put our experience to work for you. Call on Bethlehem. You'll be dollars ahead when you do.

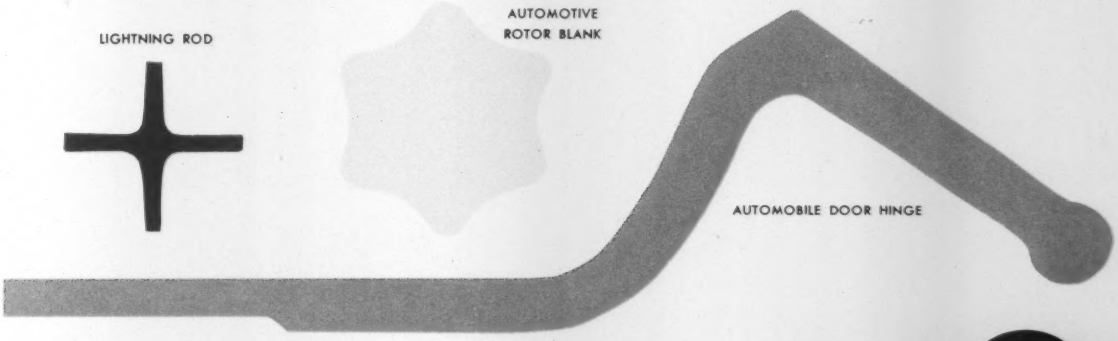
BETHLEHEM STEEL

Our quality control is your quality guarantee

LEADED STEEL

Leaded steel is the "free-est" free-machining steel known. At once, it provides for faster metal removal, increased tool life, better chip control, and smoother machined finishes than can be achieved on bar automatics from non-leaded steel.

Bethlehem will furnish any free-machining steel with this advantageous lead addition. But for the most common machining problems, we recommend you try Beth-Led. This high-sulphur, leaded carbon screw stock may be your answer to increased production with no sacrifice of quality. As a cold-finished bar product, Beth-Led is distributed through non-integrated cold drawers, any of whom will gladly answer your queries.



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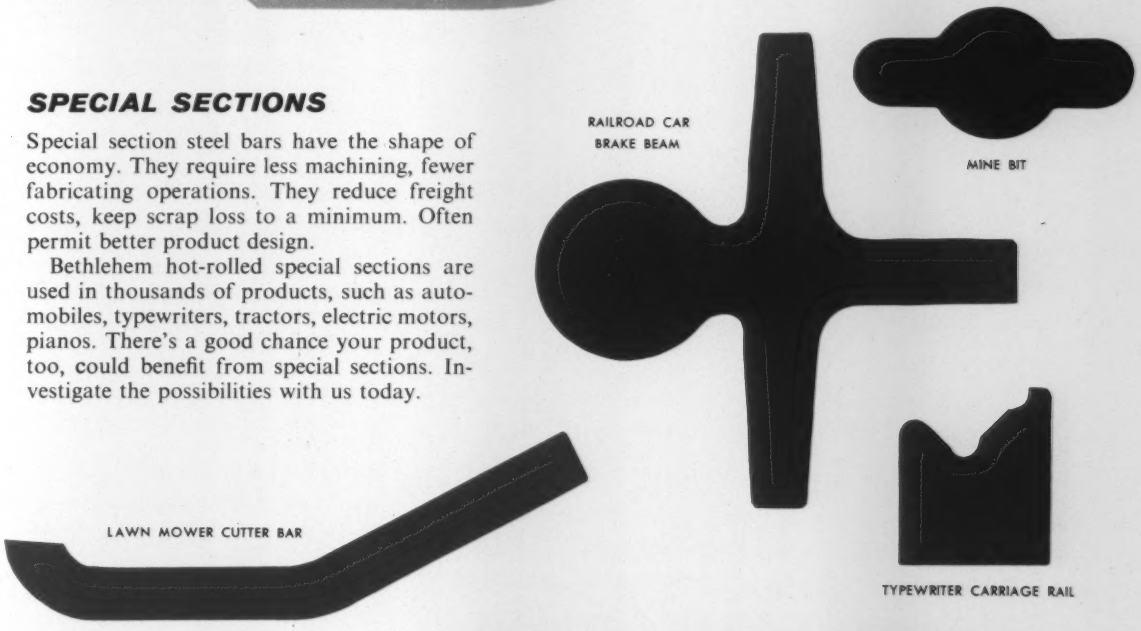
Special section steel bars have the shape of economy. They require less machining, fewer fabricating operations. They reduce freight costs, keep scrap loss to a minimum. Often permit better product design.

Bethlehem hot-rolled special sections are used in thousands of products, such as automobiles, typewriters, tractors, electric motors, pianos. There's a good chance your product, too, could benefit from special sections. Investigate the possibilities with us today.



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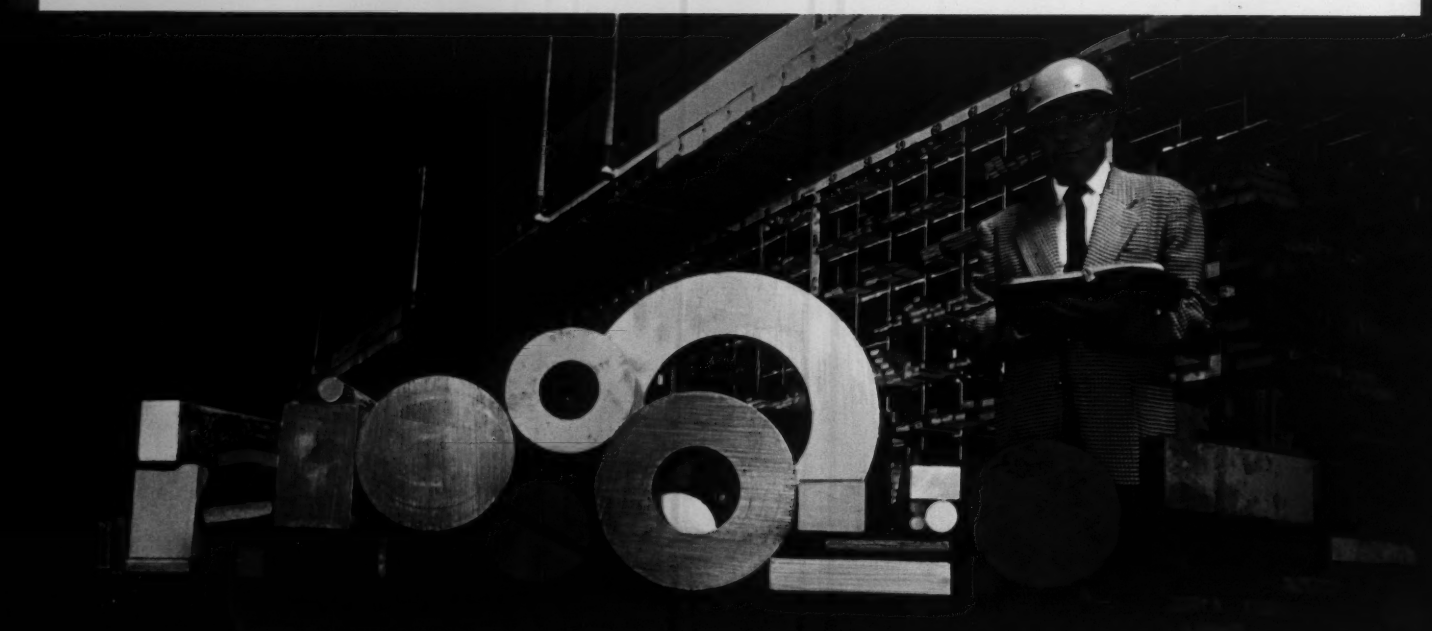
Look to Bethlehem for the best in tool steels. We produce a wide range of grades and types—a quality tool steel for every purpose. And more often than not, you'll find the bar of your specifications available right from stock. It's easy to find out: simply call our nearest representative or your local Bethlehem tool steel distributor.



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PUBLICATIONS DEPARTMENT M9
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

- ☐ BOOKLET 366, *Guide for the Selection of Carbon Steel Bars*
- ☐ BOOKLET 415-C, *Quick Facts about Alloy Steels*
- ☐ BOOKLET 513, *Tool Steel Selector*

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BETHLEHEM STEEL

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Raymond B. Kropp

Production Changes Aid Profits

Reversed production output led to efficiency and better business for Kropp Forge Co.

Raymond B. Kropp, president, was responsible for making the changes and seeing they worked.

RAYMOND B. KROPP: A hard working executive needs a full day.

▪ One of the hardest workers at the Chicago plant of Kropp Forge Co. is its president and chief executive officer, Raymond B. Kropp.

He begins his office day at about eight in the morning by checking over work he had taken home the night before. By nine he is in conference with other company executives making plans for increased production, economy moves and modernization.

Full Day—He usually starts for home at about 5:30 P.M., after several more staff meetings, a tour of the entire plant and visits with foremen, superintendents and crew members. Although there are more than 600 workers in the plant, Mr. Kropp knows most of them by name.

He began his career with the company in 1934 in the heat treating department. For five years he moved from department to department learning the rudiments of the business. In 1939 he was named vice president and treasurer of the firm.

Production Reversed — In 1956 Mr. Kropp was elected president of the company. He succeeded his brother Roy A., who became chairman of the board. Since that time the company has made major strides in rebalancing the commercial-military ratio of product output. For 15 years before Mr. Kropp's election, two-thirds of the company's output was in aviation work. The remainder was in the commercial field. Now the position is reversed and 70 pct of production is in the commercial line.

In the rebalancing process, certain economy measures had to be carried out to keep the shop operating at a profit. First, Mr. Kropp hired an engineering specialist. He was assigned to study ways of effecting economies and improve forging operations. Second, the company's Engineered Products Div. was consolidated with the machine shop and other departments at the main plant. This resulted in savings in rental and handling costs, as well as in personnel.

Up-to-Date — Then Mr. Kropp began a $200,000 modernization program. It was completed last June and was designed to improve efficiency of the steam power plants and, again, cut costs. The result has been savings of thousands of dollars in fuels used to produce steam to operate forging hammers.

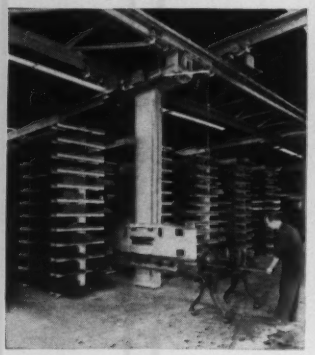
Mr. Kropp attended the University of Illinois and Illinois Institute of Technology. He is a director of the Drop Forge Assn. and the Illinois State Chamber of Commerce, and is a member of the Executive Club, Economics Club, and the Masonic Lodge of Shriners. He is also an active participant in Chicago civic affairs.

Neat, convenient and efficient steel bar storage stacked mechanically by the American MonoRail Stacker in narrow aisles

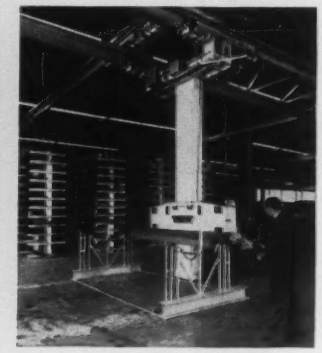
HOW'S THIS FOR STEEL STORAGE!

American MonoRail engineers, working with Hawkridge Brothers Company, designed this system for storing bars, rods and other long steel shapes.

Note the extremely narrow aisles and maximum height of racks. Bars and rods, 20-22 feet long, are placed in pans 18 feet long. The American MonoRail Stacker transfers these pans to either side of an aisle for storage.

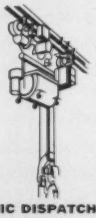


MonoRail Stacker forks support bar in saw. Saw with extension rolls to any convenient spot in the warehouse.

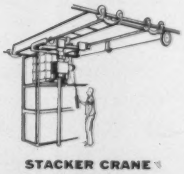


American MonoRail Stacker lowers a banded bundle of bars over prongs which ingeniously splits bands, lets bars roll into trough for pick-up in a tray.

Photos: Courtesy of Hawkridge Brothers Company, Waterbury, Conn.



AUTOMATIC DISPATCHER



STACKER CRANE

AMERICAN MONORAIL

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ENGINEERED MATERIALS HANDLING

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MEMBER OF MATERIAL HANDLING INSTITUTE AND MONORAIL MANUFACTURERS ASSOCIATION

Plan for Rougher Competition

The sales pace from now on is going to get both faster and rougher.

Money put back into research and marketing will help extend the profit life of your product line.

■ From now on, more of your sales dollar should go back into research and marketing.

If it doesn't, you may be in trouble competitively. The sales pace of the early 60's will be both fast and rough. New products will be pouring into the markets in increasing numbers. Existing ones will be redesigned to keep them competitive.

If you want to hold your own, you'll have to step up research and development. And you'll need to improve marketing methods. Emphasis on development will help relieve competitive pressures. But it will also shorten the economic life of products.

Shorter Profit Life—One business executive, William F. Crawford, vice president of Rockwell Mfg. Co., says "profit life" will be the important measure of products from now on. He predicts new capital goods products will stay competitive only about five years without major redesign.

"Research and development spur competitive obsolescence," says Mr. Crawford. "Buyers of capital equipment will be forced to replace useful goods with newer, more efficient equipment to produce competitively. Equipment suppliers, in turn, will have to update product features faster."

Thinking Ahead — Success, he adds, will come to companies with plants, equipment and people best suited to future jobs rather than companies concerned only with the jobs they are performing today.

"The job of capital equipment producers will be to keep their product mix and product features new," he concludes. "They must make customers aware they can buy updated equipment which will produce more efficiently than the equipment they now have."

Employment Shift—As research, marketing, and service get more attention, the employment mix in industry keeps changing. Changes in manufacturing payrolls reflect this growth and technical progress.

In recent years, the number of salaried employees — managers, salesmen, professional and technical personnel, and clerical help— has increased more rapidly than wage workers. The increase in professional workers includes large numbers of engineers, chemists, and other scientists.

Watch Expense Spending

■ During 1960 you'll have to keep a careful record of the money you spend for business expenses.

The Internal Revenue Service has issued the warning. When 1960 income tax returns are checked, business expenses will get special attention. The Government is out to end tax abuses in reporting these expenses.

More Data Wanted — "We are not asking anything new of employees," says Revenue Commissioner Dana Latham, "but more detailed reporting will be required on tax returns for years beginning after Dec. 31, 1959, from employers such as corporations, partnerships and sole partnerships.

He then details some of the present tax abuses. These include: Reporting business trips which are actually vacations. Listing entertainment that is really personal rather than business in nature. Ownership or use of automobiles, yachts, hunting lodges, and beach homes for the personal use of company officials or their families. Purchase with company funds of articles for the personal use of the executive, his family or friends.

Instructions Coming—Corporate tax forms are now being expanded to include a section dealing with expense items. This will ask for detailed information on expense allowances paid to or for officers.

Further word on the new reporting system will come from the Revenue Service early this year.

Sales and Orders Dipped in November

Manufacturers' sales fell a little more than seasonally in November, the Dept. of Commerce announces.

New orders were down from October levels. New business for machinery companies was below the high October rate, but ordering of metals rose.

Business inventories, seasonally adjusted, declined $500 million in November. Most of the drop was in retail stocks. Manufacturing and wholesale stocks showed little change.

This 3¢ screw cuts costs $24

83% saving on fasteners per compressor unit revealed by RB&W survey... substituting standard cap screws for alloy screws.

This was no case of cutting corners on fastener quality. Nor was it in any way a compromise with good engineering. It was rather a reflection of the ability of the RB&W Fastener Man to look realistically at a product, and its blueprint specifications, and know what fasteners can best do the job.

His inspection showed that alloy socket head cap screws were being used for external connections which did not require such costly steel for tight joints. Nor were they installed in tight spots or recessed holes. Why then *waste* their cost? His report recommended switching to bright cap screws. Sufficient joint strength would be obtained. But instead of spending $28.88 for 147 socket screws, the unit would take $4.88 worth of cap screws . . . a saving of $24 *per unit*, and pure profit!

Want to be sure you're avoiding needless costs in fastener usage, and getting the *most* from your fastener dollars? Ask an RB&W man to make a survey. No obligation. Contact Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. Sales agents at: Cleveland, Milwaukee; New Orleans; Denver, Fargo. Distributors from coast to coast.

CORVAIR COUPE: Chevrolet's new Corvair two-door coupe gets its sporty appearance from the sloping roof.

Automakers to Add New Models

Not all models of the 1960 cars are in the showrooms. Some aren't due until spring.

At least one, and possibly two, "medium price" small cars will be ready this year.—By A. E. Fleming.

▪ Automakers are still bringing out additional models for their 1960 lines. Ford is adding stationwagon models to its Falcon line. Chevrolet is producing a two-door coupe for its Corvair. And the 1960 version of the Chrysler 300 is ready for market.

At the same time, Dodge general manager M. C. Patterson brands as false, rumors that Dodge will introduce a new smaller car in the spring or early summer of this year.

However, Ford Motor Co.'s Mercury-Lincoln Div. still plans to bring out its Comet in the spring. Slightly larger than the Falcon, but smaller than the Ford, the Comet will be the first medium price offering in the compact field.

Price Changes?—While announcing the new stationwagon models, J. O. Wright, Ford Div. general manager, warned that any increase in steel prices would cause Ford to increase prices for Ford cars.

"We don't have the profit margin to absorb any substantial increases in cost," he explained. He pointed out that a cost increase of only $1 per car amounts to $1.5 million a year for Ford.

Mr. Wright noted that the new Falcon is outselling all foreign cars in the U. S. and is closing in on Rambler, the leader in the compact field. As a result, he said, Ford has raised its first year sales goal from 250,000 Falcons to at least 500,000 and possibly 600,000 units.

Spring Spadework — The new Ford Falcon stationwagon is coming in the spring. A prototype will be shown at the Chicago Automobile Show, Jan. 16. It is a 6-passenger model offered with either two or four doors. Its 90 hp, six-cylinder engine is the same as the one used in Falcon sedans.

Overall length is 189 in., about 8 in. longer than the Falcon sedan. Width and wheelbase are the same as the sedan, 70 in. and 109.5 in. Cargo volume is 76 cu ft, nearly equal to the 1957 standard Ford wagon.

Length of the load floor is 86.7 in. from the back of the front seat, nearly 9 ft with the tailgate open. Maximum load floor width is 57.3 in. A spare tire is stored vertically in a depression behind the right rear wheel housing.

'Wagons Are Rolling—The popularity of compact stationwagons has been proven by Rambler and Lark. Over one-third of American Motors production is stationwagons. Lark wagons take up about one-fourth of Studebaker production.

Valiant has been stymied until recently on stationwagon production. Output has been small. But wagons should make up over one-third of Valiant production this

spring. Wagons should also take about the same share of Falcon assembly.

Corvair Coupe — Production is underway on the Corvair two-door coupe. Exterior features distinguish it from the four-door sedan. They are a sloping roof line and larger rear wheel openings. They are designed to give the model a sports car look. Basic dimensions and rear engine are the same as the sedan. The only difference inside is a split front seat in the coupe.

The two-door model will be available in regular and deluxe models, same as the four-door Corvair. Factory list prices on the coupe are $50 less than corresponding four-door models. They are $1810 for the 500 series and $1870 for the 700 series. This does not include federal, state and local taxes, destination and delivery and handling charges.

Chrysler 300F — The Chrysler 300F is the sixth in a series of high performance sports-type automobiles turned out by Chrysler since 1955. The car is available as a two-door hardtop and convertible. It will be in showrooms on Jan. 15.

Standard engine is a 375 hp V-8. An optional 400 hp engine can be bought. Also available is an imported French Pont - a - Mousson manual four - forward - speed synchromesh gear box. The options will be in very limited production.

Knocking the Rumors — About the rumor of a small Dodge, Mr. Patterson said in a letter to Dodge dealers: "For several years our engineers have been designing and developing a smaller car. If and when we are convinced market conditions are right, we plan to add such a car to the Dodge line." He pointed out that Dodge will not market a smaller car "in the spring or early summer of 1960."

Mr. Patterson seems to be leaving the door open for an announcement in late summer or early fall. Such a model is definitely in the planning stages. Word is a Valiant body will be used.

Mr. Patterson also said there is no basis for rumor that his division plans to do away with the Dodge name. He assured his dealers that Dodge will play an increasingly important role in both the car and truck business in 1960 and the future.

1959 Auto Output: Sixth Best Year

In 1959 U.S. passenger car production totaled 5,593,745. It was more than 30 pct higher than 1958, when 4,244,160 were built.

Last year was the sixth best in history for car output. The top five years are: 1955, 7,942,132; 1950, 6,674,933; 1953, 6,134,534; 1957, 6,115,458 and 1956, 5,801,864.

Ford Beats Chevy—By corporation, 1959 output was: General Motors, 2,555,247; Ford Motor Co., 1,745,409; Chrysler Corp., 737,799; American Motors, 401,-446; Studebaker-Packard, 153,844. Their 1958 totals were: General Motors, 2,169,186; Ford Motor Co., 1,219,422; Chrysler Corp., 581,300; American Motors, 217,-332; Studebaker-Packard, 56,920.

More Fords were built than any other make as Ford wrenched first place from Chevrolet for the first time since 1935. With its own steel mill operating, Ford held an advantage over Chevrolet during the recent steel strike.

Scrambled Standings — Production standings among other makes were scrambled. Besides Ford and Chevrolet, five makes moved up, five moved down and three kept their 1958 positions. Rambler climbed most, moving to 4th from 7th. Pontiac went to 5th from 6th, Dodge to 8th from 10th, Studebaker to 10th from 11th and Lincoln to 14th from 15th.

Oldsmobile dropped to 6th from 4th, Buick to 7th from 5th, Mercury to 9th from 8th, Cadillac to 11th from 9th and Edsel, removed from the market in November, to 15th from 14th. Still in the same spots were Plymouth (3rd), Chrysler (12th), De Soto (13th) and Imperial (16th).

The Bull of the Woods

WHUT'S THAT YOU'RE PUTTIN' IN THAT PAINT ?
THIS? OH, THIS IS WOT GIVES PAINT A LASTIN' FINISH--ONE PINT OF MURIATIC ACID TO ONE GALLON OF PAINT!
THAT WOULD PUT A LASTIN' FINISH TO PAINT --IT WOULD EVEN EAT ALL THE BRUSHES UP! HE WON'T TELL NO TRADE SECRETS FOR FEAR TH' GUY MIGHT PAINT HIS OWN HOUSE!
WELL, HE CAN'T BE SUCH A BAD GUY--HE'S ONLY PRESCRIBED ENOUGH ACID TO EAT TH' PAINT UP --NOT ENOUGH TO EAT TH' HOUSE UP-- SO HE AIN'T SO MEAN!
WHITE LEAD
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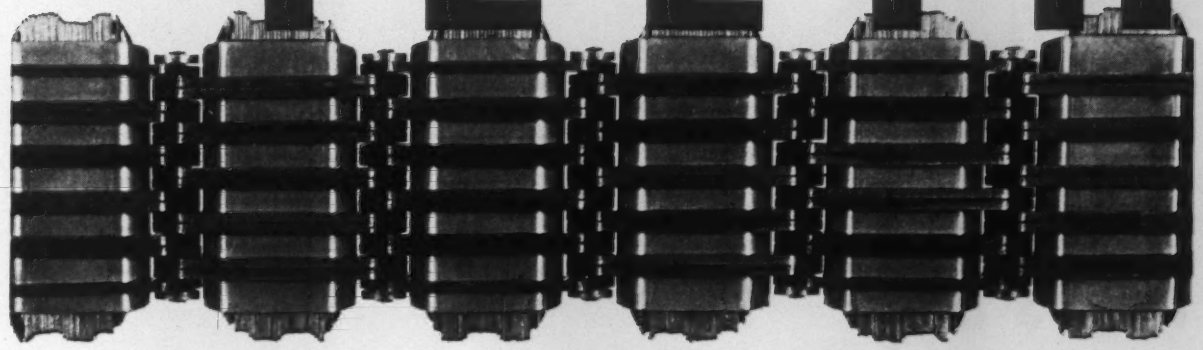
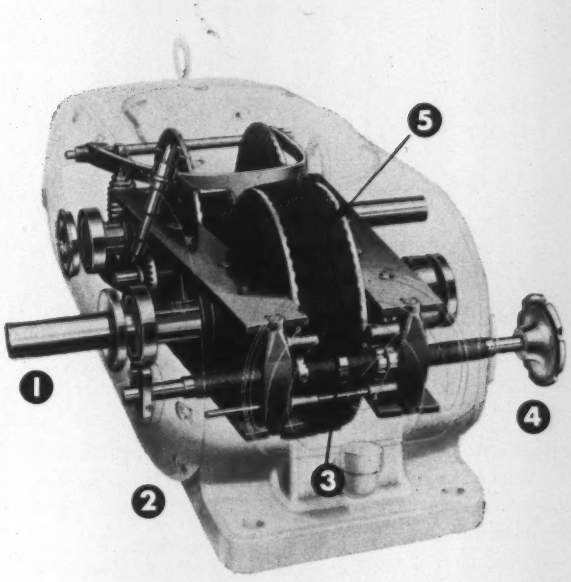
TRADE SECRETS

PUT TEETH



IN YOUR SPEED CHANGING JOBS



Get the positive, accurate control that only LINK-BELT's chain-driven P.I.V. can deliver

Yes, you put teeth into your speed changing jobs because Link-Belt P.I.V.—unlike other variable speed drives—utilizes an exclusive metal, self-tooth-forming chain.

Here's how it works! P.I.V. chain consists of a series of overlapping steel links. The links contain packs of slats which are free to move from side to side, singly or collectively, to serve as teeth. The chain meshes with radially grooved wheels, which are cut to a constant depth towards the wheel periphery. Beveled sides of the grooves offer gripping areas . . . provide a positive, nonslip contact at any speed, under all loads.

Makes changing speed simple too! A turn of the control screw simultaneously varies the effective diameters of the conically shaped wheels—closing one set, spreading the other. At the same time, the self-tooth-forming chain automatically adjusts to provide desired ratio between the input and output shafts.

BOOK 2274—Your Link-Belt office or authorized stock-carrying distributor has Book 2274 on P.I.V. drives from ½ to 25 hp. Refer to the yellow pages of your local phone directory under Power Transmission Equipment.

(1) You can get minute speed changes and maintain them accurately while operating under full load.

(2) All-metal, totally enclosed—unaffected by atmospheric conditions. All vital operating parts splash-lubricated from a common housing reservoir.

(3) Easy-view speed indicator facilitates speed selection and adjustments to meet all requirements.

(4) An infinite number of positive, stepless speed adjustments may be made with manual, electric, pneumatic or hydraulic controls.

(5) Self-tooth-forming chain is made from a series of overlapping steel links. Links contain packs of hardened steel laminations or slats (shown above). Slats grip toothed wheels positively without slippage —give the speed you need at any setting.

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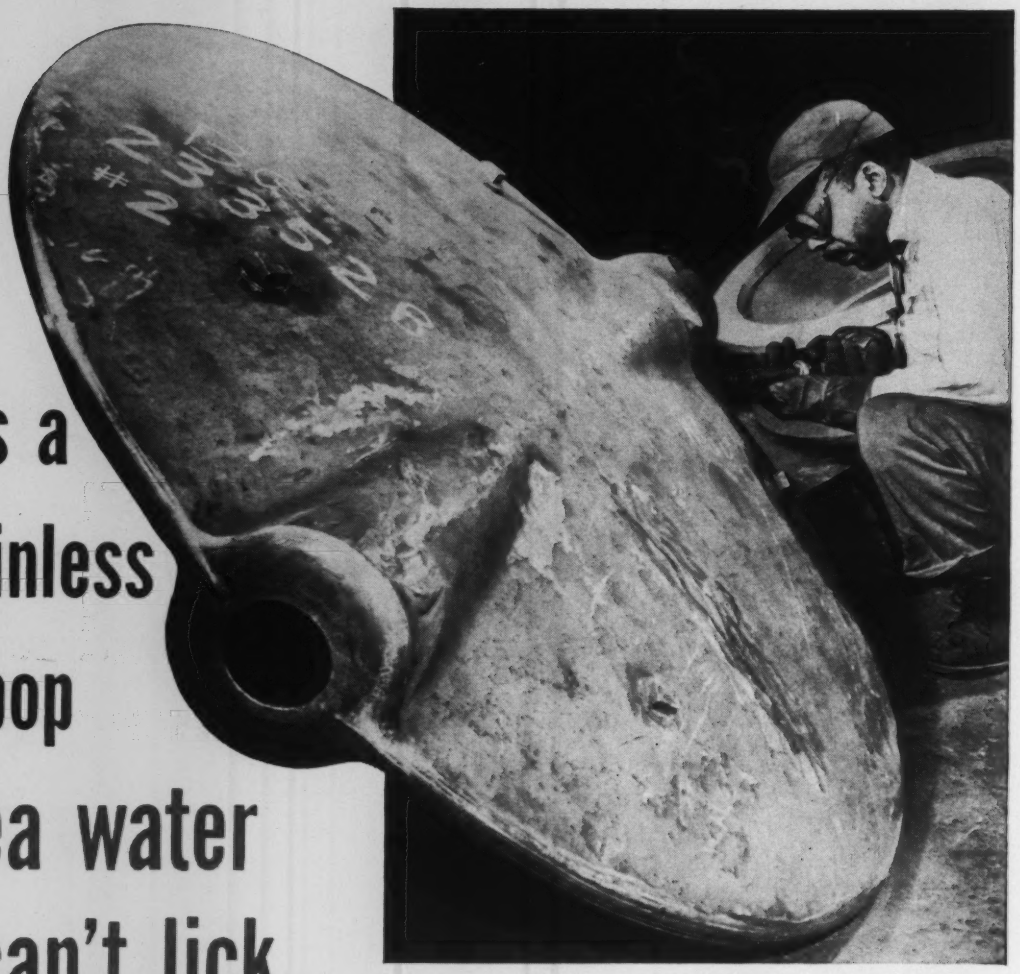
LINK-BELT

P.I.V. VARIABLE SPEED DRIVE

Here's a stainless lollipop sea water can't lick



This large (48″ dia., 1701 lbs.) and unusual stainless casting was fabricated by Allegheny Ludlum's Buffalo, N.Y. foundry. It is scheduled for service under the most severe operating conditions, functioning as a wafer valve disc at 25 psi pressure in sea water. Since long life and tight closing are essential in this application, corrosion resistant Type 304 Allegheny Stainless was specified.

Some unusual techniques were employed in the fabrication of this casting. Although the entire valve disc was cast as a single piece, its sides are hollow, with a skin only ¾″ thick. The center shaft was cast solid at the same time the side wings were cored, permitting the single piece, seamless part desired.

If you have a casting problem, or *any* problem that involves corrosion resistance, long life, resistance to wear and abrasion, call the Allegheny Ludlum Sales Office nearest you. An A-L Sales Engineer is ready to put his skills and those of the A-L Technical Staff promptly at your disposal, to serve your requirements from the largest and most complete line of stainless products on the market.

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Get Ready for More Inflation

There's no Turning the Upward Spiral This Year

The big factors in the new surge of inflation are the higher steel wages and robust consumer demand.

Consensus is 1960 will be a boom year.—By G. H. Baker

■ A new surge of inflation this year is now inevitable.

The upward spiral of costs and prices is being sparked by higher steel wages (which will inevitably be followed by higher prices), and by robust consumer demand.

Boom Year—It's to be a year of unprecedented production, expansion, and sales.

Washington politicians have been claiming that 1960 — an election year—will be a boom year. Such claims must be considered skeptically of course, in light of the political campaigns now under way. But even after applying the usual discount it is evident that the year ahead will see astonishing new records in virtually every segment of the U. S. economy.

Sales Record—Industry can expect record sales, with profits to match. Much new investment — financed by costly interest charges —will be required, however.

Consumers can look forward to full employment, many new products and services, and higher prices.

Effect of Steel Strike—It is now clear that though the steel strike, dampened overall industrial production and caused personal hardships in steel-making areas it has not slowed business expansion. Demand for steel is likely to remain stronger for a longer period than if there had been no strike. Steel fabricators must face the prospect of tight supplies for many months to come.

Not only will every product made of metal cost more before the year is out, but transportation charges, also, are headed for a rise. Railroad management, faced with a nationwide strike within the next 90 days, fears the new steel wage contract may well set the pattern for its own settlement. If so, higher rail and truck rates are inevitable.

Steel set the wage pattern for 1960. It is only a matter of time until unions in other industries demand the same.

Worker Trends

The number of white collar and skilled workers in the electronic-automation age of the 1960's will climb sharply. The numbers of unskilled will remain stable.

That's the way the U. S. Labor Department sees the employment picture for the next decade. While the number of unskilled clerks and similar workers will drop as electronic and mechanical machines take over more and more functions, the workers displaced will have plenty of opportunity to find other job opportunities.

Business should have an ample labor force. There will be about 13.5 million more workers by 1970. But firms will have to do more training to get the help they'll need.

The forecast is part of a new "Occupational Outlook Handbook" published by the Labor Department. It lists comprehensive employment prospects for 600 occupations in 30 major industries. Copies are available from the Superintendent of Documents, Washington, D. C., for $4.25 each.

When They'll Change T-H

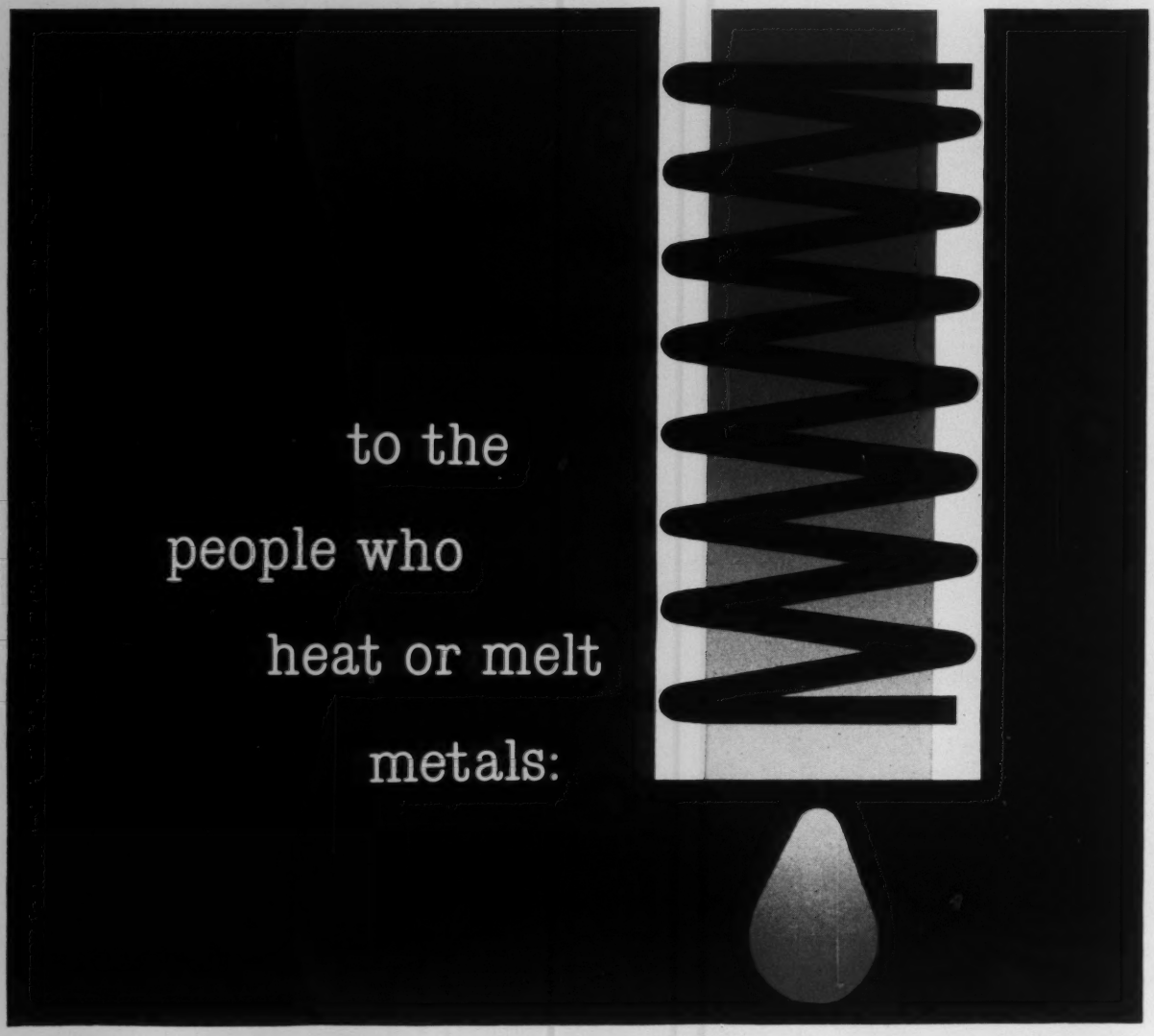
■ Congress is ready to take a long look at the strike-settling provisions of the Taft-Hartley Act. But action will be at least a year away.

The lawmakers breathed a collective sigh of relief when the steel deadlock was broken. They weren't looking forward to tackling such a ticklish problem in the tensions of an election year.

Better This Way — Many congressmen believe some changes will eventually have to be made in the Act's machinery for dealing with strikes which cause national emergencies. But with the steel strike settled, they can take their time about it.

If the strike had resumed, the law would have required the President to submit recommendations to the Democrat-controlled Congress, and a wide-open fight would have been on.

Possibilities — Both houses of Congress are expected to begin studying the Taft-Hartley strike machinery this year. Proposals include extension of the anti-strike injunction, compulsory arbitration after a certain time, a ban on industry-wide bargaining, and giving government fact-finders power to recommend terms for settling disputes.



Induction Heating is used to heat all metals, including the new high-temperature alloys and exotic metals, to temperatures ranging from a few hundred degrees to several thousand degrees.

Historically, Induction Heating manufacturers have specialized and have provided a service to specific application areas. This specialization has confined the many advantages of Induction to a few specific fields. Actually, most metalworking operations can be improved by the use of Induction equipment.

By joining the pioneer companies (Ajax Electrothermic, Ajax Engineering and Magnethermic) into one company, we offer a service unavailable before. A single manufacturer of Induction equipment with the background, facilities and product line permits an unbiased evaluation of your heating or melting application.

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How Farwest Will Grow in 1960s

Dynamic Decade Predicted for the Area

Population growth, new households, industrial expansion all add up to a strong decade for the Farwest.

Here's a state-by-state rundown on what to expect in next ten years.—By R. R. Kay.

▪ Most Farwest businessmen and industrialists are sure of another banner decade in the 1960's. Forecasters predict growth in every segment of the economy in the 11 Western States. They differ only as to how fast and how far.

Here's a state-by-state rundown on what you can expect by 1970. Metalworking companies can use these forecasts as a guide. They're based on studies by the Stanford Research Institute, the U. S. Bureau of the Census, and the National Assn. of Mfgrs., Western Div.

California: 20,696,000 persons; 6,856,000 households—26 pct hike over 1960; labor force growth of an explosive 37 pct; 2,361,000 more men and women holding jobs and 135,640 new business firms.

Right now California's industry and construction uses up 75 pct of all the steel consumed in the Farwest.

Oregon: 2,153,000 persons; 676,250 households—up 16 pct over this year. This state's industry and business will add 143,400 workers to their payrolls. Some 7880 new firms will set up shop.

Washington: 3,342,200 persons; one million households—up 14 pct over 1960. There will be jobs for 210,700 more Washingtonians. And 10,350 new business firms will hang out their shingles.

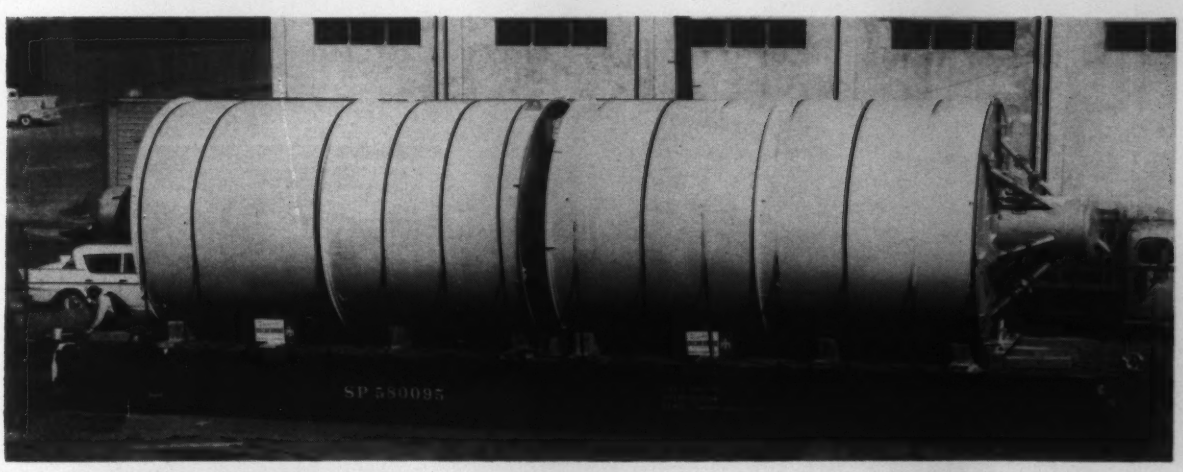
Colorado: 2,139,900 persons; 638,280 households—a 17 pct jump. The NAM says that Colorado's labor force will grow by 141,800. That's a 21 pct gain during the next ten years. There will be 9580 new firms.

Arizona: 1,857,000 persons; 587,175 households—26 pct over 1960. The Grand Canyon State will give 259,000 more jobs to its residents. And 12,900 new companies will start up.

Utah: 1,125,200 persons; 301,155 households—up 21 pct from this year. Best estimates are that the state's labor force will grow by 79,200 or 27 pct from today's 294,900 to 374,100 in 1970. And there will be 4660 new business firms.

How many residents will the 11 Western States have in 1970? The NAM says 35 million. That's an 8 million gain during the decade. California, alone, adds 1500 new persons every day of the week.

Metalworkers just can't afford to overlook the opportunities this will make.



FOR ATOMIC WASTES: These 15-ton bins, fabricated by Oscar Krenz, Inc., Berkeley, Calif., for Atomic Energy Commission, will hold atomic wastes. They each consist of three concentric tanks of 405 stainless steel, plus a carbon steel skirt. Air-tight welding is used throughout construction of the huge bins.

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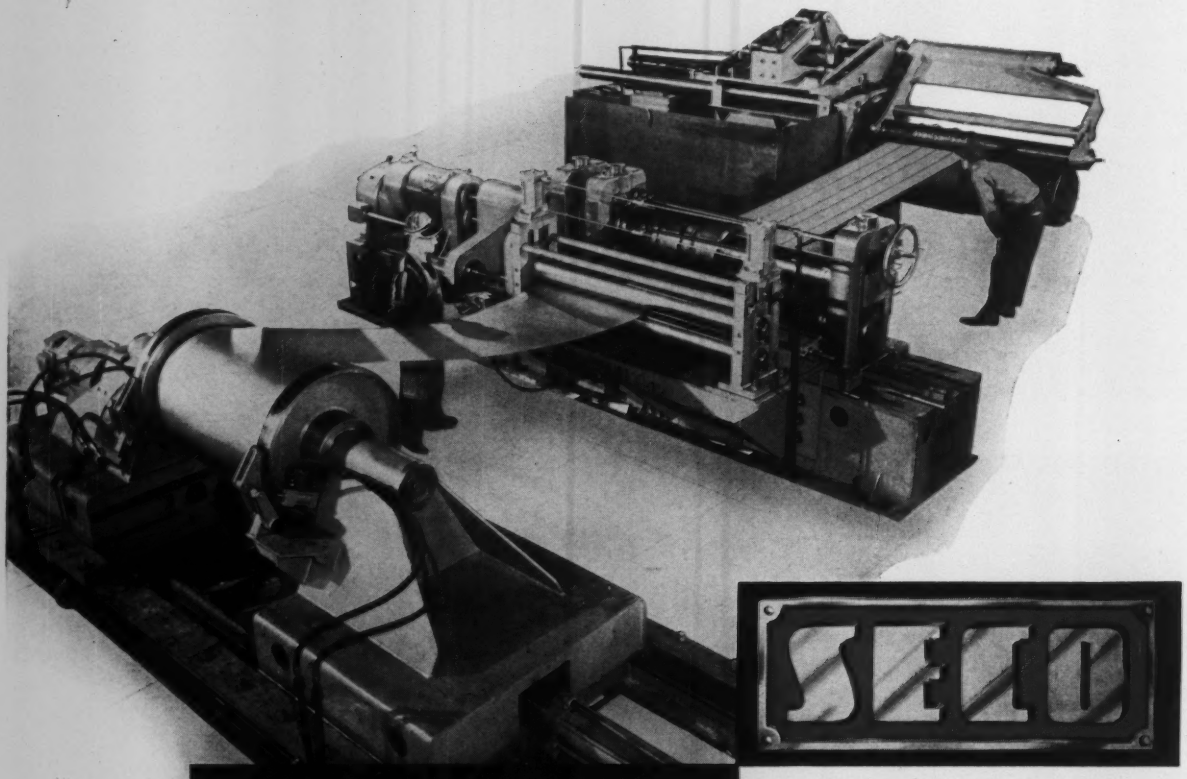
SECO 60" SLITTING LINE

Availing themselves of SECO's facilities for custom building efficient slitting lines, the Detroit Steel Corporation, Detroit, Michigan, just recently installed this 60" Seco Slitting Line thereby assuring predictable performance. The entire unit, consisting of a cone-type Uncoiler, Slitter and Recoiler, was specifically designed and built by SECO for this customer.

Whatever your present requirements may be, call upon SECO's staff of trained sales engineers to assist you in planning for the present as well as your 'future' capacity.

Seco builds a complete range of slitting lines available from 12" to maximum strip widths.



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Fresh Approach Improves Honing

Parts Stacking Gets Higher Production, Lower Costs

Improvements to honing efficiency had just about reached the point of diminishing returns.

Micromatic Hone took a new, but basic, approach for better results.—By R. H. Eshelman.

■ When designers begin to feel a machine has reached the acme of efficiency, perhaps it's time to back off and take another look at the operation. A basic, yet simple, switch in thinking can pay big dividends.

Take, for instance, this honing job. Automatic tool feed and size control seemed to have reached the optimum in precision finishing rocker arms. Four-spindle vertical and six-spindle turret type machines yielded high production.

What's Next?—But how far can you go? Add more spindles; boost output. Yet you make the design more and more complex, bigger and bigger. Also it's more subject to breakdowns and other production interruptions.

For a better answer, Micromatic Hone engineers took another look at the key elements: The tool and the work. Instead of adding more spindles why not stack the parts in a row?

The Results—A check of results from this approach shows the rewards of originality. Some advantages:

1. Higher rates of production.
2. Simplified equipment whose cost is drastically reduced.
3. Big savings in abrasive, through using longer stones in in tool.
4. Less setup and maintenance; greater reliability, fewer spare parts.

Actually the principle is nothing startling new. A form of stack honing was used about 20 years ago, in a vertical machine. But the operation had some bugs in it. New materials, controls, and other improvements on the idea now make it practical for today's precision needs.

Some Features—One thing that helps is a special guided-type tool. This has plastic guides to position the parts properly before the honing head passes through. This type tool works very successfully on interrupted bores. And essentially that's what the stacking of parts amounts to—a long interrupted bore.

Then, by using a stone (on the hone) about four times longer than normal, engineers find they get much greater tool (abrasive) life. That means more production between stone changes; less downtime.

Automatic Loading—Fixturing is important. It's quite elemental, however. Parts float between parallel plates. With this type tooling you can have automatic loading and unloading, too.

Another factor in success of the operation is built-in air gaging. With each tool stroke, an air cylinder shoves a gaging plug in the opposite end of the parts stack. When the job is finished to size, this in-process gage shuts off the hone.

Automatic Lathe Set in Operation

ROLL LATHE ROLLING: This 48-in. Macintosh-Hemphill automatic roll lathe was recently placed in operation. It automatically cuts contours in structural and shape rolls up to 4 ft in diameter.

INDUSTRIAL BRIEFS

Granite City Expansion — The Granite City Steel Co. is building a 175-foot-long extension of the pit or "tapping" side of its openhearth building. An expansion program started early in 1959 and will be completed in 1961. It will increase steelmaking capacity of the company's seven openhearth furnaces to 1.7 million tons a year—300,000 tons more than Granite City's present annual capacity.

Three for Three—Pacific Iron & Steel Corp., Los Angeles, has merged into Standard Railway Equipment Mfg. Co., Chicago. Pacific Iron will continue to manage the company as a subsidiary of Standard to be known as PI Steel Corp. Pacific Iron is Standard's third expansion move in the last three years.

Crane Wants Swartwout—Crane Co., Chicago, plans to acquire The Swartwout Co., Cleveland manufacturers of electronic control equipment. The move is subject to approval by Swartwout stockholders on Jan. 11. Crane manufactures valves, fittings, plumbing and heating equipment. Terms of the transaction have not been disclosed.

Coming: More Oxygen—An oxygen generating plant is being built with a 400-ton per day capacity by the Mingo Oxygen Co., Mingo Junction, O. It is a joint venture of Hydrocarbon Research, Inc. and Wheeling Steel Co. The $6 million plant will sell oxygen to Wheeling Steel and liquid oxygen and argon for industrial distribution.

More Coke, Less Smoke—The Pittsburgh Works, Jones & Laughlin Steel Corp., plans to build a $9.5 million battery of by-product coke ovens. Contracts for the new battery have been awarded to the Wilputte Coke Oven Div. of Allied Chemical Corp., New York. The battery will include 118 smokeless-type ovens.

Siding from Alcoa — Aluminum Co. of America and five producers of residential building products will market a new Alcoa product—eight inch clapboard aluminum siding. It will be advertised as Alcoa Siding and will be sold by dealers and dealer applicators of Allied Chemical Corp., Bird & Son, Inc., Flintkote Co., Mastic Corp. and the Philip Carey Mfg. Co.

Welding at the Mill — A plant designed for welding sections of railroad track immediately upon their emergence from the steel rolling mill is being built at Minnequa, Colo., by Chemetron Corp. The plant, adjacent to the mill of Colorado Fuel & Iron Co. is expected to be completed in February.

Working for the Navy—The Materials Handling Div. of Minneapolis-Moline Co. has U. S. Navy orders of close to $3.2 million. Under contracts awarded the division will build about 1000 tow tractors of 4000 lb drawbar pull and fork lift trucks of 4000 and 6000 lb lift capacity for the Navy.

Wheeler Aids Battelle—Dr. J. A. Wheeler, nuclear physicist and professor at Princeton University, has been appointed to the Board of Trustees of Battelle Memorial Institute. A member of the Princeton faculty since 1938, Dr. Wheeler has often served as a consultant to government defense agencies.

"Maybe next time he'll walk to the coffee shop."

Plant in Puerto Rico—Gibson Caribe, Inc., has broken ground for a new plant in Luquillo, Puerto Rico, to manufacture electrical contacts and contact assemblies. The new corporation is a subsidiary of Gibson Electric Co., Delmont, Pa. This will be the only plant in Puerto Rico making electrical contacts.

Plastics Pilot Plant—ESB-Reeves Corp. has begun development for a pilot plant operation in newly acquired facilities at Glenside, Pa. The Electric Storage Battery Co. and Reeves Brothers, Inc. are joint owners of the concern. The new company will develop all processes and products related to microporous plastic materials and will market them.

Rockwell to Geneva—Rockwell Mfg. Co. has established Rockwell International S. A., a wholly-owned sales subsidiary with offices in Geneva, Switzerland. The Geneva office will coordinate all of Rockwell's foreign business other than Canada and Mexico.

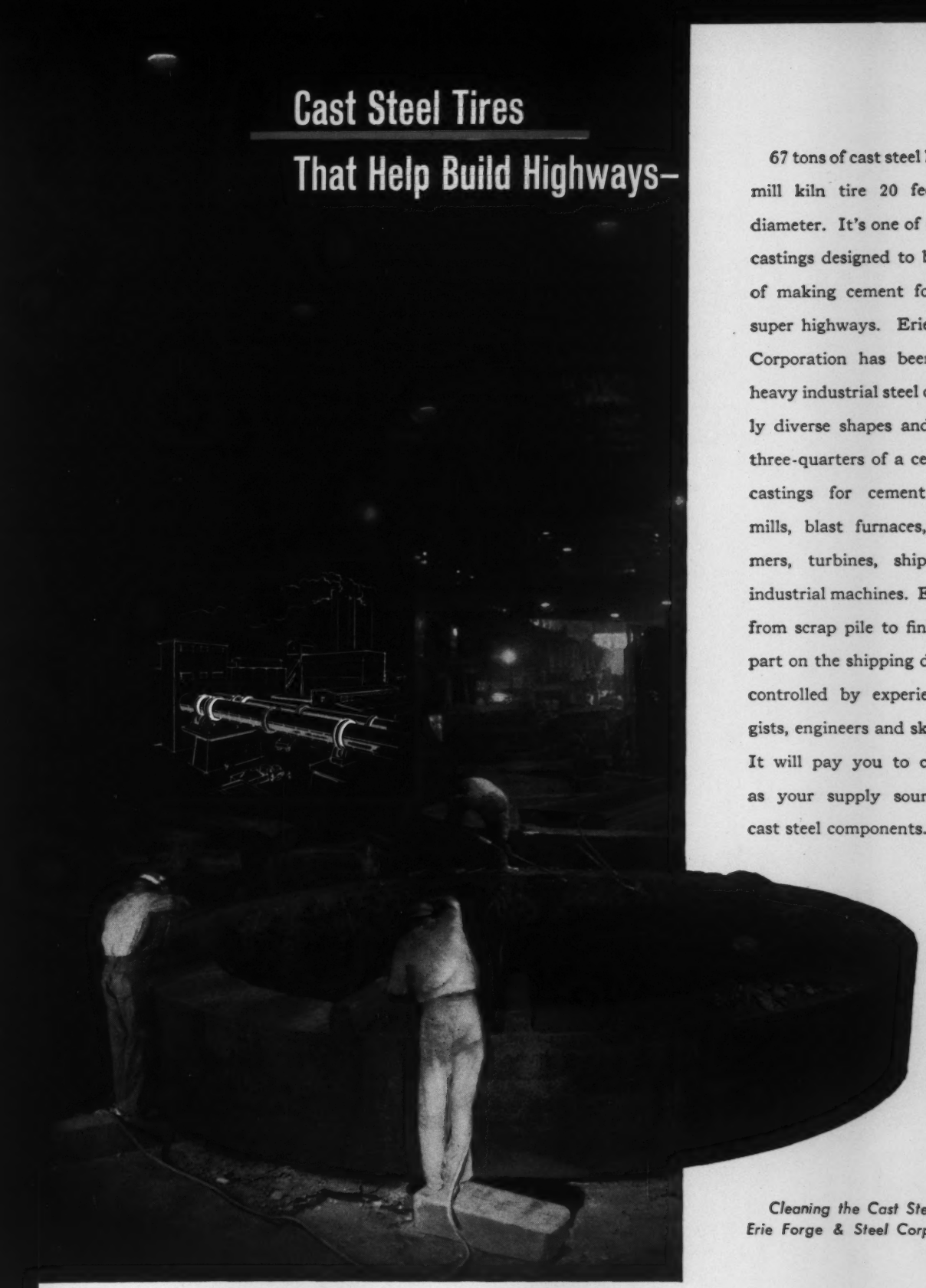
Jet-Powered Compressor — The Federal Power Commission has given approval of plans by Columbia Gulf Transmission Co. to build a new jet-powered compressor station at Clementsville, Ky. It will incorporate the new type 10,500 hp gas turbine being developed jointly by Cooper-Bessemer and Pratt & Whitney Aircraft.

Off With the Old — Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., has changed its name to the Birdsboro Corp. The corporation replaces a name that has been with the company since 1894.

Financing Arranged — A sales financing agreement has been signed between National Steel Corp. and Associates Investments Co., South Bend, Ind. Associates Investments will handle financing for the sale of steel buildings by Stran-Steel Corp. and Metallic Building Co., both divisions of National Steel.

Cast Steel Tires That Help Build Highways–

67 tons of cast steel here!—a cement mill kiln tire 20 feet 7 inches in diameter. It's one of many such steel castings designed to bear the burden of making cement for your smooth super highways. Erie Forge & Steel Corporation has been making such heavy industrial steel castings in widely diverse shapes and sizes for over three-quarters of a century . . . steel castings for cement mills, rolling mills, blast furnaces, presses, hammers, turbines, ships at sea and industrial machines. Every operation, from scrap pile to finished cast steel part on the shipping dock, is quality-controlled by experienced metallurgists, engineers and skilled craftsmen. It will pay you to consult with us as your supply source for quality cast steel components.



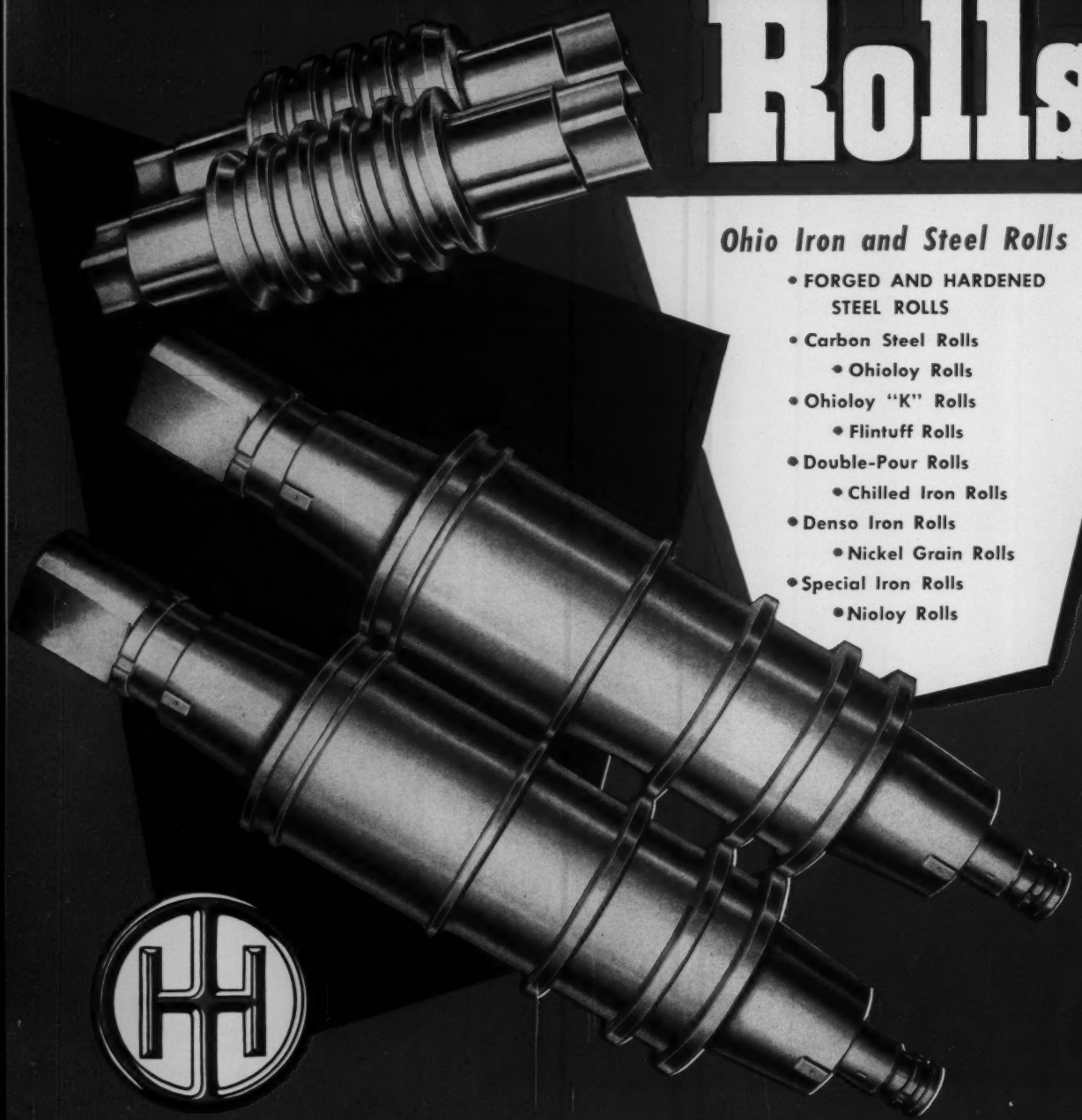
Cleaning the Cast Steel Kiln Tire in Erie Forge & Steel Corporation foundry.

ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY



Ohio Iron and Steel Rolls

- FORGED AND HARDENED STEEL ROLLS
- Carbon Steel Rolls
- Ohioloy Rolls
- Ohioloy "K" Rolls
- Flintuff Rolls
- Double-Pour Rolls
- Chilled Iron Rolls
- Denso Iron Rolls
- Nickel Grain Rolls
- Special Iron Rolls
- Nioloy Rolls

THE OHIO STEEL FOUNDRY CO., LIMA, OHIO

PLANTS AT LIMA AND SPRINGFIELD, OHIO... *Virtually at the center of the steel industry*

W. B. Quail, elected vice president, distribution, Armco Steel Corp.

Crane Co. — **W. A. Songer,** elected president and chief administrative officer.

Chrysler Corp., Marine and Industrial Engine Div. — **W. L. Pringle,** appointed president.

National Carbon Co. — **C. J. Chapman,** appointed vice president, marketing.

Hewitt - Robins, Inc. — **E. B. Gardner,** appointed executive vice president.

The Anaconda Co. — **William Wraith, Jr.,** elected an asst. vice president; **T. K. Graham,** named metallurgical manager.

Copper Alloy Corp. — **A. J. Reichers,** appointed general plant manager.

Midland-Ross Corp. — **C. J. Schmidt,** named vice president.

Thompson Pipe & Steel Co.— **S. M. Davidson,** becomes first vice president; **J. L. Brown,** named vice president, product development; **C. K. Crews,** named controller, and **R. E. Gilmor,** named chief engineer.

Empire Steel Corp.—**R. D. Conroy,** elected vice president.

Consolidated Electrodynamics Corp., Data Processing Divisions— **R. H. Garretson,** appointed group vice president.

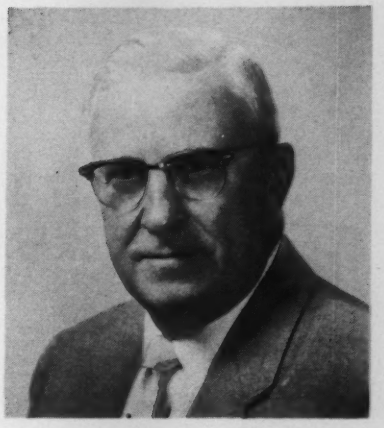
The Electric Storage Battery Co., Missile Div.—**L. E. Pucher,** appointed general manager, Raleigh, N. C.

Williams & Co.—**E. F. Kindinger,** named manager, Foundry Dept.

Borg-Warner Corp. — **W. F. Martin,** appointed director, manufacturing services.

The Youngstown Sheet & Tube Co. — **C. L. Christophersen,** appointed supervisor, industrial relations, Chicago district.

International Business Machines Corp. — **J. J. Kenney,** appointed special assistant to the president.



M. B. Wilson, named vice president, sales, Armco Div., Armco Steel Corp.

U. S. Steel Corp., American Bridge Div.—**S. G. Harris,** appointed comptroller.

National Broach & Machine Co. —**Frank Kirsten,** appointed factory manager and **Carl Motz,** appointed chief engineer.

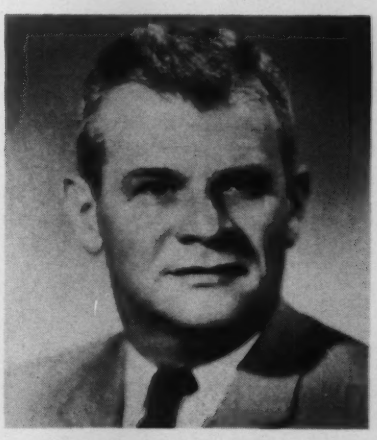
The National Acme Co., Electric Controls Div. — **George Rienerth,** appointed products manager.

U. S. Steel Corp., American Steel & Wire Div.—**I. C. Sengenberger,**

(Continued on P. 55)

Goff Smith, elected vice president, American Steel Foundries.

L. T. Moate, elected vice president, American Steel Foundries.



W. V. Covert, elected vice president, American Steel Foundries.

3 NEW SERIES IR SCREW DRIVERS

give you an ANNUAL DIVIDEND on your PAYROLL DOLLARS

NEW **DESIGNS**
SPEEDS
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If your operators are using older model screw drivers, you can increase their man-hour productivity by as much as $3750 Payroll Dollars in one year, just by replacing the older tools with one of the three new I-R designs.

Multiply these *Annual Dividends* by the number of screw driver operators in your plant, and you can see why management today is taking a new look at portable tool operations.

There's a fast, easy way to calculate the amount of *Dividend on Payroll Dollars* these new I-R screw drivers can help you earn in just one year—without adding to your present payroll.

It's yours without obligation. To get it, call your I-R AIRengineer today. Or write Ingersoll-Rand, 11 Broadway, New York 4, N. Y.

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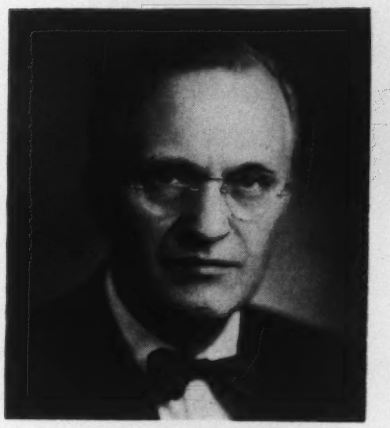
Ingersoll-Rand

Tools plus AIRengineering increase output per man

(Continued from P. 53)

appointed asst. to the manager, operations, Chicago district.

Midvale-Heppenstall Co. — **H. C. Myers, Jr.,** appointed director, metallurgy, Philadelphia.

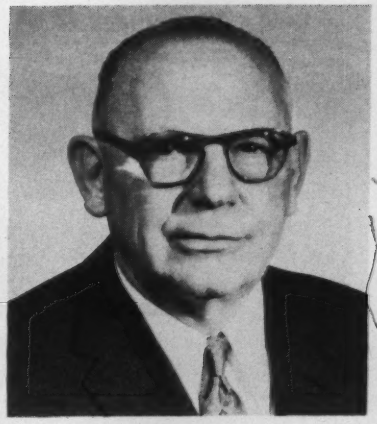


Erling Ringstad, appointed executive vice president, Copperweld Steel International Co.

E. W. Bliss Co., Press and Die Supply Divisions—**H. A. Skillman,** named West Coast manager, and **M. J. Jefferis,** named factory manager.

National Steel Corp. — **William Winters,** named asst. district sales manager, New York office and **Donald Fannin,** appointed asst. district sales manager, Sales Dept., Los Angeles office.

R. G. Birkin, appointed sales manager, Heavy Machinery Div., The Cleveland Crane & Engineering Co., Wickliffe, O.



C. B. DeVlieg, named chairman of the board, DeVlieg Machine Co., Royal Oak, Mich.

American Chain & Cable Co., Inc.—**J. S. Buckley,** appointed sales manager, Pennsylvania Power Mower Div., Exeter, Pa.; **F. M. Jackson,** appointed sales manager, R-P&C Valve Div., Reading, Pa.

Republic Steel Corp. — **B. K. Bugg,** promoted to superintendent, plate and hot strip mills, Gadsden plant.

C. R. DeVlieg, named president, DeVlieg Machine Co., Royal Oak, Mich.

Burroughs Corp.—**H. G. Bowles,** elected controller.

Armco Drainage & Metal Products, Inc., Great Lakes Div.—**G. R. Betts,** becomes asst. division manager; **W. A. Carleton,** named division sales manager; **W. O. Wood-**

(Continued on P. 58)

ONE ORDER, ONE SOURCE
. . . every fastener need

How to maintain working-level inventories

Storing extra stocks of fasteners is expensive and space consuming. Screw and Bolt Corporation makes it possible for you to end inefficient, costly overbuying and maintain properly balanced inventories. Nationally situated plants, distributors and warehouses stand ready to supply you from existing stocks, when you need them. If it's specials you want, our experienced designers can quickly come up with the answer. Remember, only one order from this one source can fill your every fastener requirement.

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where engineering makes the difference

LAKE ERIE MAKES GOOD

Lake Erie has recently built some of the world's largest and most highly engineered presses

- **Pictured at right—a self-contained 2000 ton forging press for Allegheny Ludlum Steel Corporation.**
- **A 6500 ton briquetting press for Titanium Metals Corporation of America.**
- **A vertical copper extrusion press—said to be the world's largest —for Scovill Manufacturing Co. (2500 tons capacity).**
- **A 10,000 ton combination drawing and stretch forming press with a 24 foot x 9′ 3″ bed for McDonnell Aircraft Corporation.**

Right now Lake Erie is building more of the world's largest and most highly engineered presses

- **A unique 166 foot long 450 ton draw bench with 44 foot stroke —the largest known—for drawing pipe up to 20″ in diameter with 1″ wall thickness.**
- **A self-contained (oil operated) 4300 ton aluminum extrusion press for Reynolds Metals Company.**

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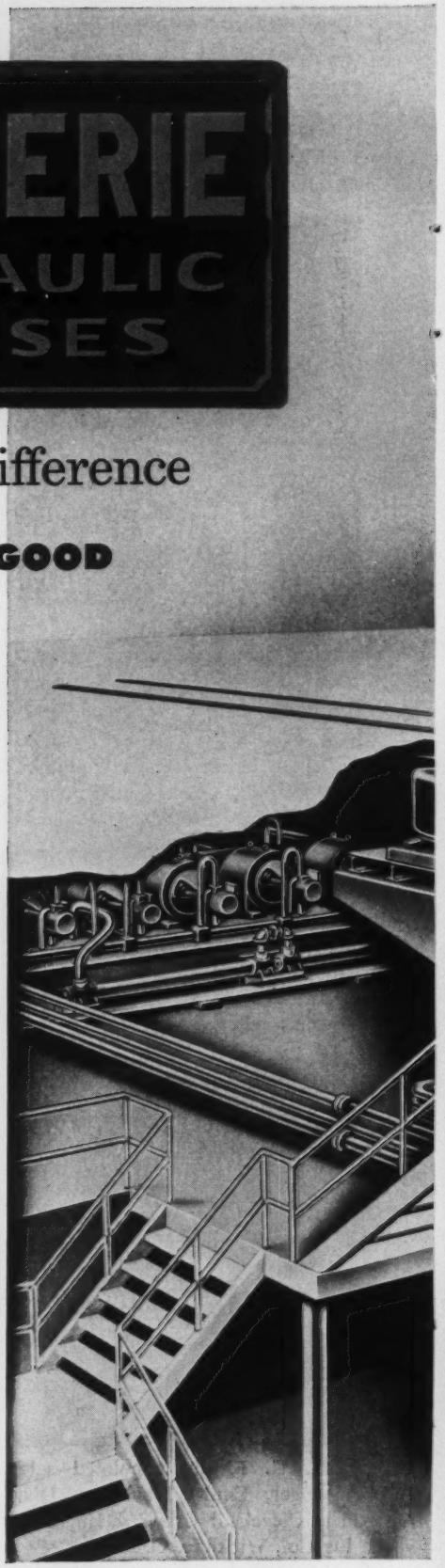
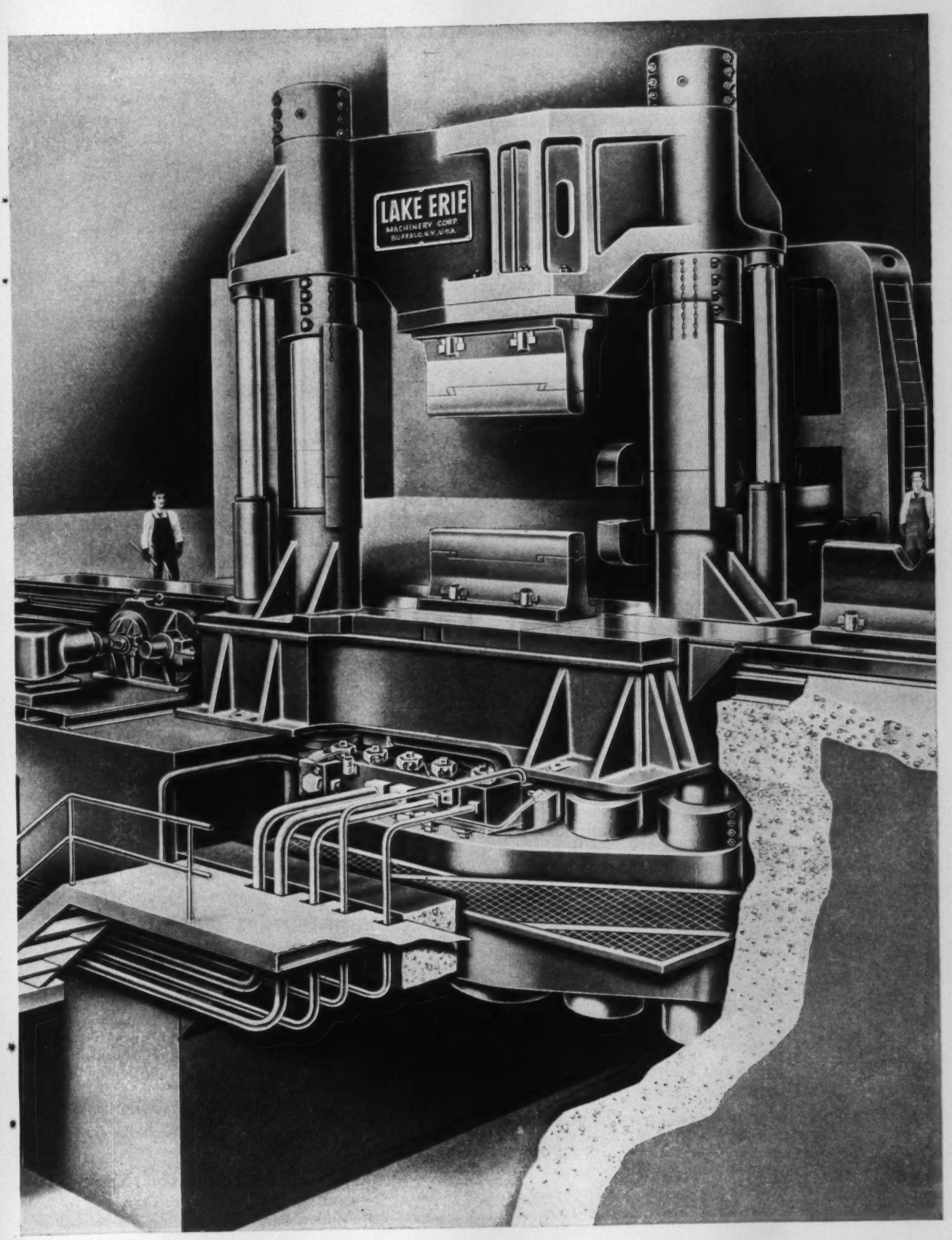


ARTIST CONCEPTION of the unusual 2000 ton Allegheny Ludlum forging press which is currently operating three shifts a day. It is impossible to illustrate this press photographically because it extends through the floor.


LAKE ERIE
MACHINERY CORP.
BUFFALO, N.Y., U.S.A.

(Continued from P. 55)

house, appointed manager, Lansing district sales.

Norton Co.—**R. V. George** and **E. R. Larson,** appointed field engineers.

Bethlehem Steel Co., Supply Div.—**H. W. Robinson,** named California resident sales manager.

Harbison - Walker Refractories Co.—**J. A. Pierce,** promoted to manager, technical sales.

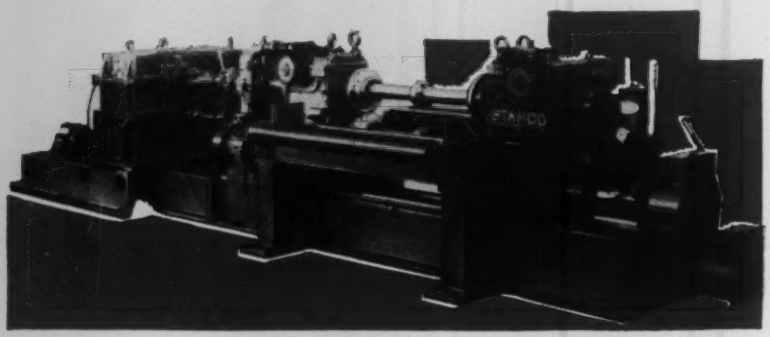
Wyckoff Steel Co.—**Jack Sage,** appointed manager, service, Pittsburgh.

Mallory-Sharon Metals Corp.—**G. L. Flint,** named western district sales manager.

The Jeffrey Mfg. Co., Mining Div.—**Peter Ambrosiani,** appointed manager, Western Territory.

Byron Jackson Pumps, Inc.—**F. H. Trones,** appointed Midwestern regional manager.

Top efficiency and versatility at low cost with Stamco side trimmer



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Bethlehem Steel Co., Pacific Coast Div.—**M. A. Thompson,** appointed manager, industrial fastener sales, San Francisco general sales office.

Master Pneumatic, Inc.—**R. L. Edwards,** promoted to general sales manager.

Electro Tec Corp.—**V. L. Haag,** appointed director, manufacturing.

Sharon Steel Corp.—**J. E. Brady,** appointed asst. to the treasurer; **J. R. Rinderknecht,** appointed director, profit control; **R. H. Jones,** appointed asst. to the treasurer.

Anaconda Sales Co.—**F. L. Chandler,** elected secretary-treasurer.

Erie Foundry Co.—**R. O. Newton,** named sales manager.

Fischer Special Mfg. Co.—**C. H. Gross,** named marketing manager and **R. L. Payne,** promoted to sales manager.

The Budd Co.—**R. H. Coburn** and **W. A. Grant,** appointed district sales manager, Electronic Controls Section.

Stromberg - Carlson's Electronics Div.—**L. D. Catlin,** appointed director, management services, and **D. Y. Keim,** director, engineering.

Baker Steel & Tube Co.—**C. L. Baker,** named general manager.

OBITUARIES

E. H. Nielsen, 75, retired foundry consulting engineer, Whiting Corp.

J. C. Pangborn, 75, co-founder, Pangborn Corp., Hagerstown, Md.

R. W. Harbison, 83, member of the board of directors, Harbison-Walker Refractories Co., Pittsburgh.

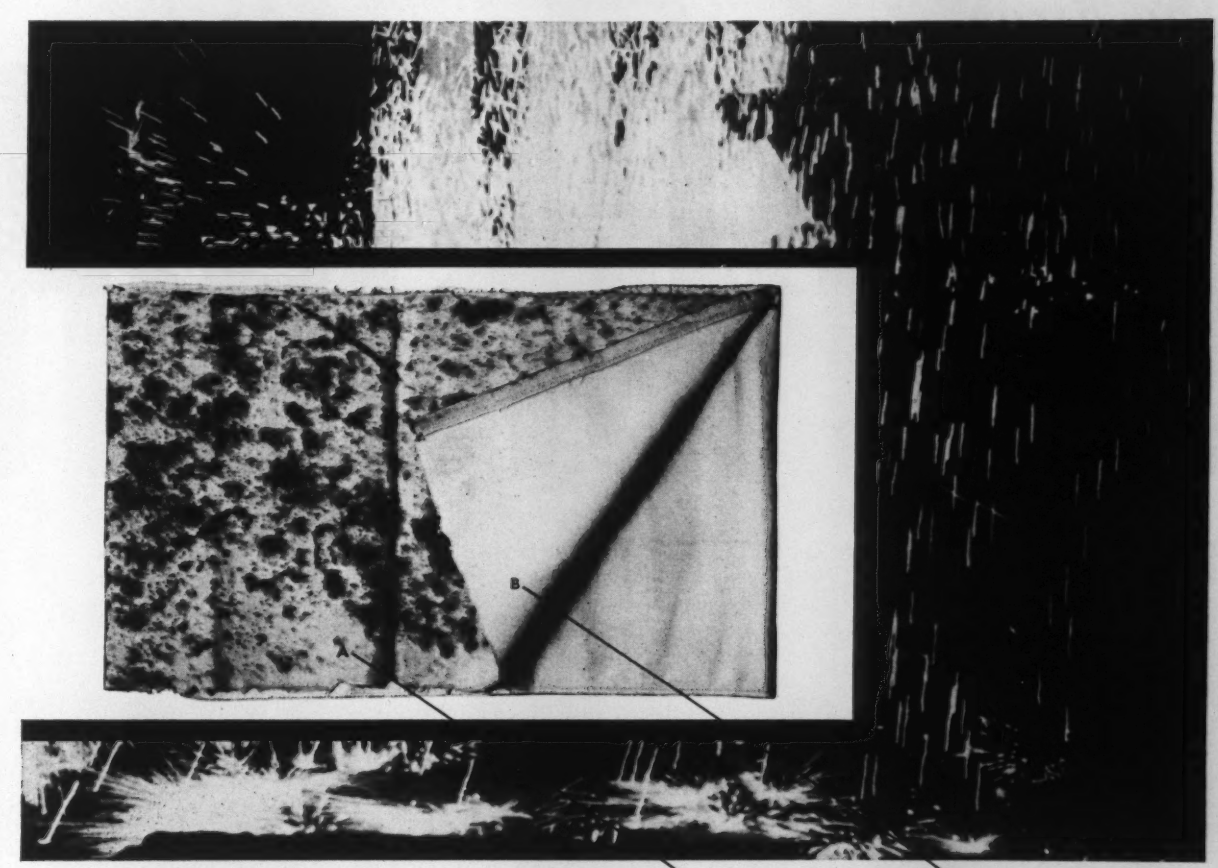
R. B. Whyte, 73, a director, Mac-Whyte Wire Rope Co., Kenosha, Wis.

R. C. Feigles, 50, works manager, Sprout, Waldron & Co., Inc., Muncy, Pa.

BELIEVE IT OR NOT...

This material was exposed to 3000°F molten splash!

IT'S NEW AO "THERMOGARB" ASBESTOS CLOTHING



A Here's the *outer* side of the material which was directly exposed to the molten splash at a distance of 8 feet from the pour.

B Here's the *inner* or wearer side of AO Thermogarb. After 42½ minutes of splash exposure there's no burning through or penetration, no scorching, not even a blemish.

AO Thermogarb is a NEW *lightweight* asbestos cloth. A 30-inch length coat weighs approx. 3¾ lbs. as against conventional asbestos coats of 6½ lbs. — or approximately the same weight as aluminized asbestos coats of the same length. This completely field-tested material is available in a complete line of body protection for high heat — molten splash protection. Your nearest American Optical Safety Products Representative can supply you.

American Optical
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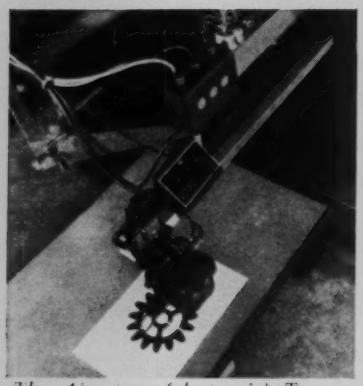
Always insist on AO Trademarked Safety Products

the Airco LINAGRAPH



The Aircotron (electronic) Tracer accurately follows a gear templet.

The Airco LINAGRAPH is the newest, finest multiple torch machine on the welding market today for flame cutting intricate shapes out of mill plate up to 96″ wide, in any length.

The LINAGRAPH's pantograph design enables its Aircotron (electronic) Tracer to follow a templet so precisely that in most cases further finishing of the flame cut part is unnecessary.

The LINAGRAPH features also a central location of all controls. Furthermore, the tracing table moves easily on rollers—lets you move the templet without moving the work itself.

It cuts steel plate up to 96″ wide and up to 12″ thick, using acetylene, natural or city gas or propane with up to six torches. The LINAGRAPH requires floor space only 19′3″ wide.

Extra lengths of rails and tracks and extra tracing tables can be ordered, and right- or left-hand operation is available.

For complete information on the New Airco LINAGRAPH, phone your nearest Air Reduction office. Or write us today for Catalog 804L.

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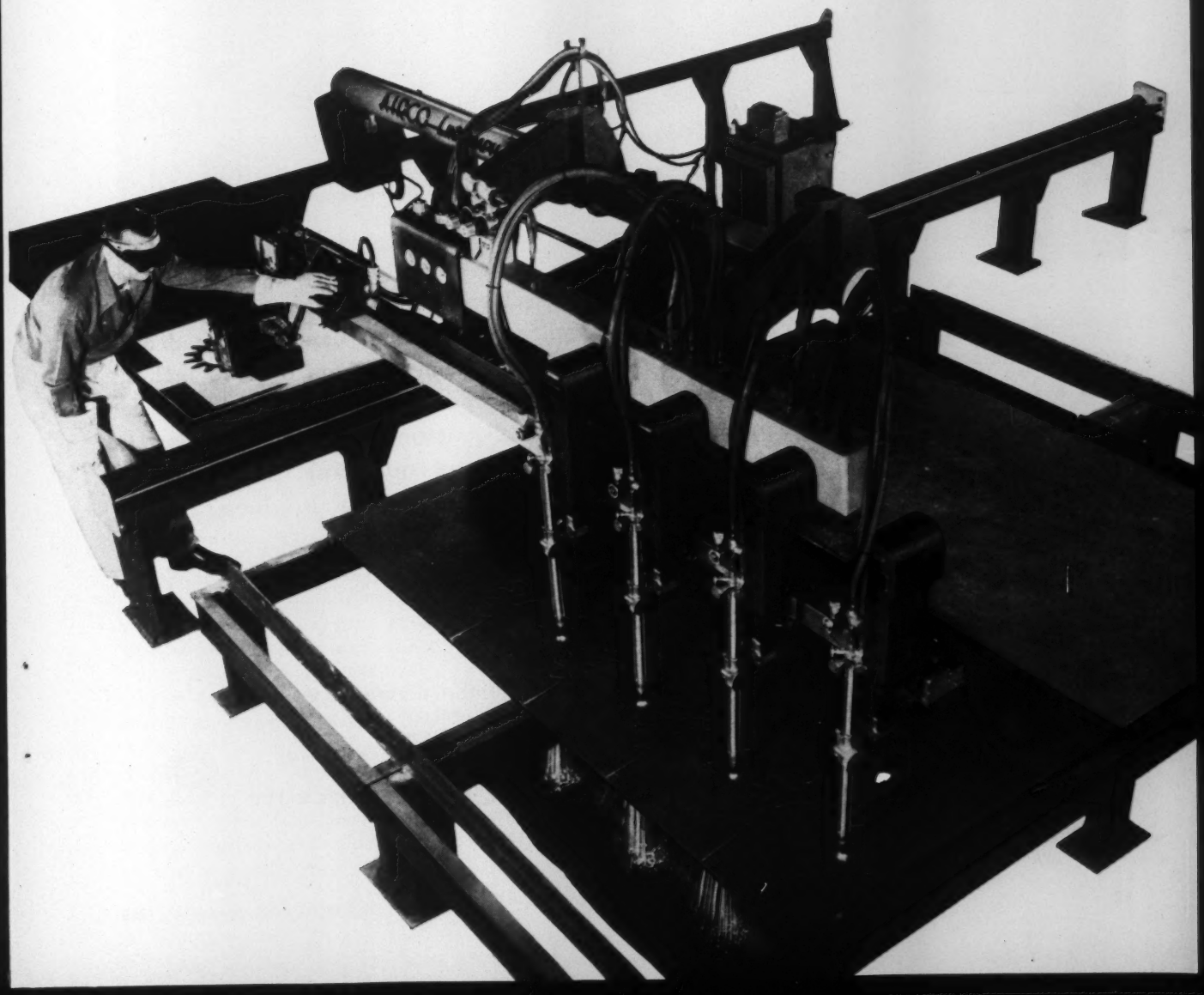
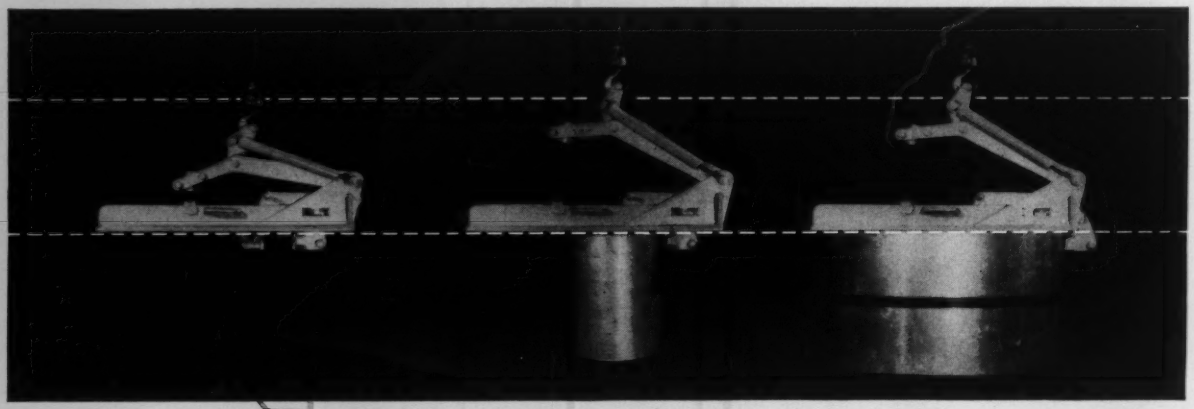
IT'S HERE

to make your flame cutting jobs more profitable



NEW HEPPENSTALL COIL TONGS

stack large and small diameters to within 24 inches of the crane hook



Only two feet high at greatest extension, these new Heppenstall Tongs put more coils into less space, faster. By simple manual adjustments, these tongs handle inside diameters as small as 5 inches and up to 20 inches, outside diameters from 6 to 40 inches, with a 1,000 pound capacity rating. Custom models of this same design will handle coils up to 3,000 pounds. For more information and a quotation, call your Heppenstall Company Representative or send us your load and operating requirements. Heppenstall Company, Materials Handling Division, New Brighton, Penna.

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PLANTS: Pittsburgh, Pa. Bridgeport, Conn. • New Brighton, Pa.

MIDVALE-HEPPENSTALL COMPANY • Nicetown, Philadelphia 40, Pa.

Die Blocks • Forgings • Back-up Roll Sleeves • Rings • Industrial Knives • Materials Handling Equipment
Pressure Vessels • Hardened and Ground Steel Rolls

IF IT HANGS FROM A CRANE . . . HEPPENSTALL CAN HANDLE IT

Tape-Controlled Jig Borer Takes on Third Dimension

By Walter Van Horn—Mfg. Engineer, Lockheed Missiles and Space Div., Sunnyvale, Calif.

Most errors in precision machining can be traced right back to the human element.

Linear programming helped stem this tide in jig-boring operations. A more refined unit now controls depth of bore.

■ It takes time and it costs money to bore close tolerance holes to a given depth. This is very true in the missile industry where accuracy is a must.

Such operations require the work to be laid out and checked constantly while the part is in process. And the slightest error can play havoc with manufacturing costs.

Research has come up with an answer to this problem. It's a tape-controlled jig borer. Lockheed Missiles and Space Div. purchased two of these units from The Fosdick Machine Tool Co., Cincinnati.

These machines not only control table and saddle locations, spindle feeds and speeds, but the depth of bore as well. The latter trait is the newcomer to the programmed setup.

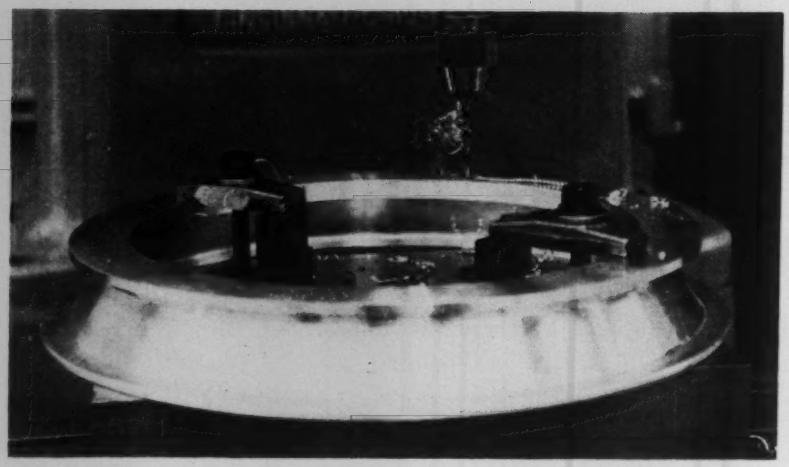
Reduced Time—With the addition of depth control, Lockheed is now getting considerably better than 50 pct reduction in manufacturing time. That's compared to the same machining operations it used to run on conventional equipment.

The tool design department programs dimensions, feeds, speeds and depth. This information is then punched onto a tape. So, by controlling these functions numerically, it's easy to transfer the most ideal operating skills straight to the tape. In doing so, you can hold the correct depth of bore to ±0.001 in.

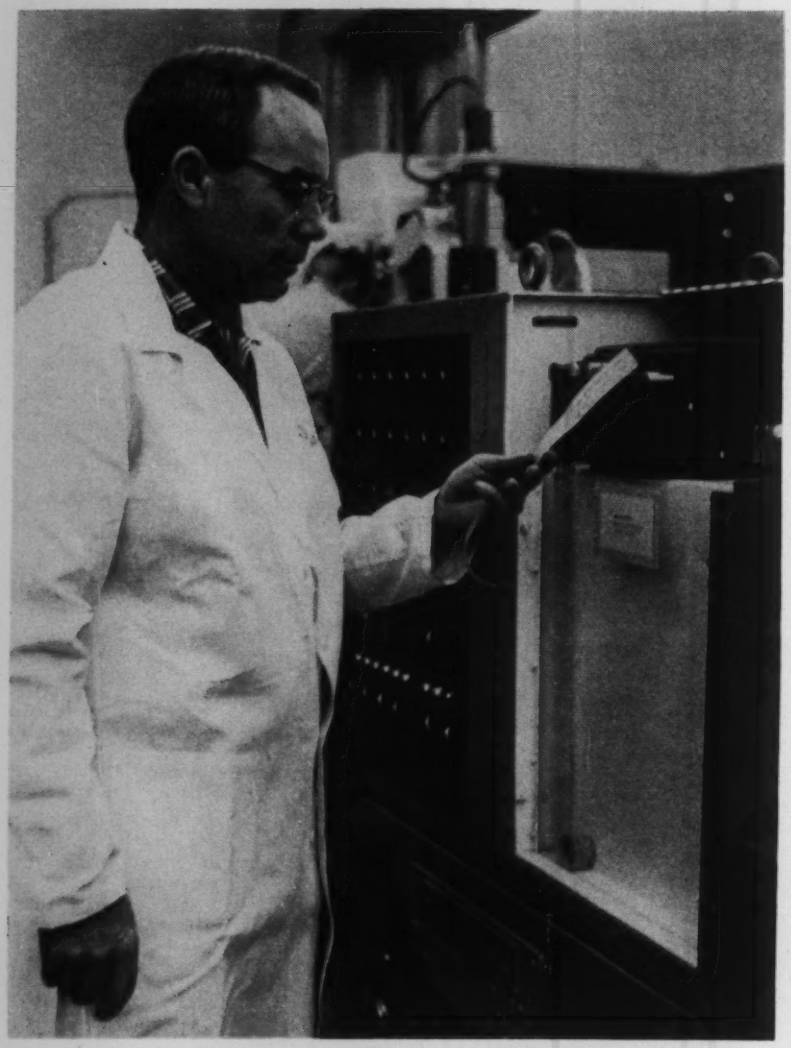
Naturally, this decreases the non-cutting intervals, so common when split-second decisions are left in the hands of the machine operator. It also cuts down on rejects and holds scrap to a minimum.

Boon for Tooling—Use of tape-controlled equipment eliminates costly tooling. The tape also takes on three new jobs. It now becomes

SUPPLYING THE DATA: Lockheed production team discusses program sequencing. Team includes (from left) Messrs. Wells, Van Horn and Heale.



RELIABLE BORING: Throughout the boring operation, the tape can be relied upon to repeat the function automatically and accurately.



FINAL CHECKOUT: One-inch wide automatic programming tape controls the boring sequence. The tape carries eight individual channels.

the drill fixture, the inspector and the checking fixture.

There's never a delay in changing speeds and feeds. It's done instantly from data stored on the tape. This is accomplished on the machine through magnetic clutches in the gear train.

In operation, the spindle advances in rapid traverse to within 1/64 in. of the work surface. Then it is shifted into the desired feed rate and fed to the prescribed depth. At this point, after a brief dwell, the spindle is retracted at rapid traverse.

Independent measuring systems for spindle rapid-traverse depth and feed depth provide separate control of each function. This means that each tool used can be programmed for any rapid traverse or depth required.

Holding the Line—A special device compensates for variations in tool lengths which need only be known to the nearest ½ in. Built right into the machine control, this device is easily adjusted by the operator during setup, or to correct for tool wear.

This tool length compensator eliminates the need of presetting tool length. Nor is there any need to purchase all new tooling in order to use the machine efficiently. More than often, tools already within the plant will suit the job.

Many times an entire job can be programmed with as few as five or six different tools even though it may have 30 or 40 different operations involving several different depths of cut for each tool. This feature puts the machine in actual operation, cutting metal, most of the time.

Triple Axis—Earlier models of this jig borer, operating with two-axis control, achieved much faster production than conventional models. The improvement here varied from two to one to as high as six to one. By controlling depth automatically, even greater production gains are insured.

The heart of the machine is its direct dimension measuring system. This system sets up coordinate dimensions mechanically by aligning selected Class A gages.

Gage stacking is a standard inspection method for establishing accurate dimensions, and the Fosdick system provides even better consistency. How? It eliminates all gage handling.

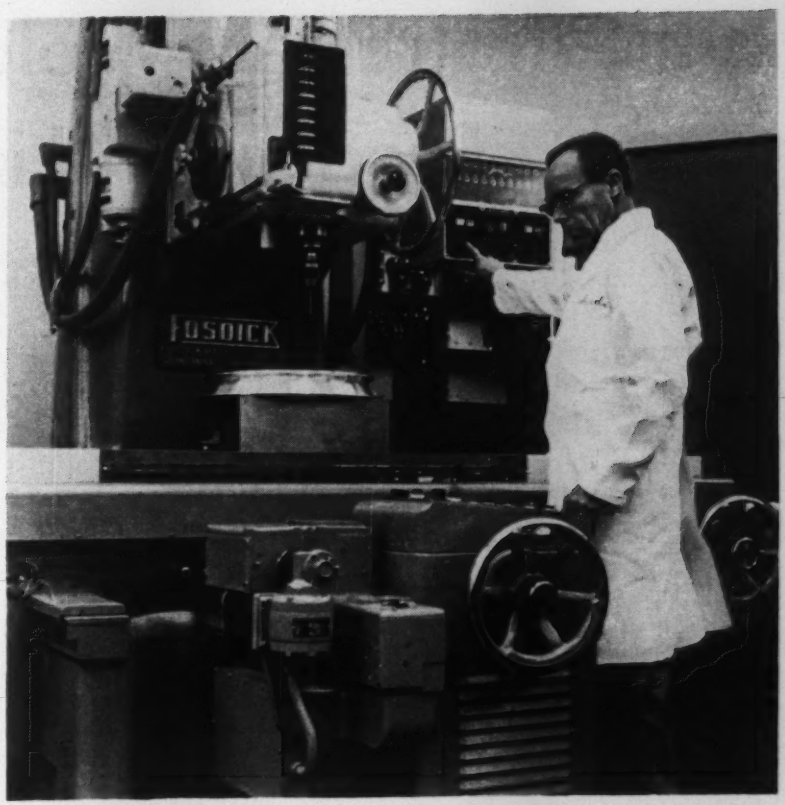
The control console features the tape reader for 1-in. eight-channel tape. The tape reader starts reading data for the next step as soon as the table begins the automatic positioning cycle. Before the table reaches final position for the first operation, the tape has already been read and data stored for the second operation.

Knowing the Score—Numerical preselect dials on the console may also be used to control any of the numerically - controlled functions. Other features are indicators showing machine operation number and tool number. There is also a signal that lights up whenever a tool change is required. When this red light goes on, the machine moves to the next position but the spindle will not cycle until the "tool-changed" button is pressed.

The memory system in the Fosmatic unit is compact. It's an electromechanical system. The only moving parts are three cross-bar switches, a bank of sealed relays and a couple of stepping switches. These parts are all housed within the control console, so designed to prevent any dust from entering the system.

Trouble-Shooting — The source of operational "bugs" can be traced very easily. Lights are provided to signal malfunction in the reader and buffer storage circuits. Each one of these signal lights represents a segment of the buffer storage. When one of these lights goes out, it pinpoints the exact area of trouble.

Relays and cross-bar switches are of the plug-in type. Spares are stored within the control console. Since no electronic devices of any kind are used, maintenance can be handled by an able electrician.



STARTING THE CYCLE: As soon as the vertical tape-controlled jig bore goes on automatic cycle, tape controls take over the operation.

Answering Your Questions—What parts can the tape-controlled jig borer handle? Any part that requires the drilling or boring of more than one hole.

At Lockheed rejection rates have tumbled almost to zero. Once the tape has been inspected properly and a successful sample part run, there's little chance for operator error.

These machines only require a normal amount of operator training. After tape inspection and sample part run, it then becomes little more than a pushbutton operation.

On Tape—The Sunnyvale plant now has 45 different parts scheduled for, or on tape. Formerly, all of these would have required more extensive tooling.

Under the present setup, the operator can produce parts with jig borer accuracy on depth. And he can do this without any special effort on his part.

This does away with a very serious time delay in boring operations. Once the machine is put into automatic cycle, he merely changes tools and sets tools for size.

These machines will soon be available with numerical control of head height and automatic tool changers. They will then become completely automatic.

The tool changer is a separate unit that will fit right into existing machines.

Reprints of this article are available as long as the supply lasts. Write Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Is Electron Beam Welding Ready For the Production Line?

By Mars Hablanian—Chief Development Engineer, NRC Equipment Corp., Newton, Mass.

Bridging the gap between research and actual production has been difficult for electron beam welding.

New, less costly equipment may give the process the push it needs to weld a wider range of metals.

▪ There's no doubt that electron beam heating is a big step forward in metalworking. It's useful to alloy and refine reactive and refractory metals. These include zirconium, tantalum, tungsten, columbium and other hard-to-melt metals.

The electron beam overcomes such problems as contamination and costly remelting. Someday, it may even prove to be the most practical method to deposit these metals.

The question right now is: Does it hold an edge over conventional processes to justify its use as a joining method on a production scale?

If you base your answer on the number of new welders announced by manufacturers, the answer is "yes." But, based on the number of machines sold and in daily use, the answer would have to be "no."

Six Figures—One of the greatest stumbling blocks to the acceptance of the equipment has been its "solid gold" price tag. Few companies are willing to part with $100,000 for a machine to weld the exotic class of metals.

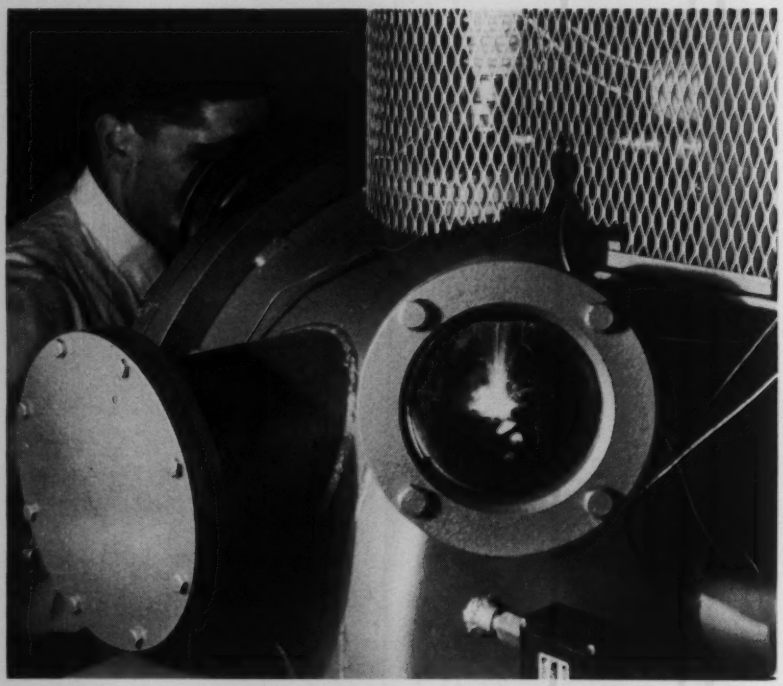
A newly-designed electron beam welding machine may snap this resistance to price. Developed by NRC Equipment Corp., Newton, Mass., the new unit is much lower in price than former models. The new machine also overcomes some of the barriers inherent in earlier designs. It takes in a broader range of usage, too.

The new equipment comes equipped with a gun capable of generating 3 kw at a maximum current rating of 150 milliamperes. Maximum operating voltage is 20,000 v. Although the new unit cannot provide the same depth-to-width ratios produced by equipment using higher voltages, it can still give an excellent 1:1 ratio, a feat in itself.

The electron beam does not replace the inert-gas technique of welding aluminum, magnesium or stainless steel. And it's certainly no tool for welding conventional steels. There are too many other methods capable of producing quality joints at much less cost.

Applications?—You can use the process to weld dissimilar metals, aluminum to carbon steel or stainless to titanium, for example. One case history reveals an instance where a gold-plated aluminum sphere was welded without damaging the adjacent plate.

You can apply electron beam welding on hermetically-sealed instruments where vacuum is already present. You can top off thermocouples, too. It's also well suited



WELDING MOLY: Sparking, caused by high gas content of molybdenum sheet, shows ability of the welder to operate without arcing.

for fine welding of thin-gage materials or in joining fuel elements.

Granted, some materials are not easy to weld with the process. Those having high vapor pressures at their melting points, like magnesium and chromium, are good examples. Care is also needed to weld thermal conductivity materials (copper and aluminum).

On any of these metals, welding is extremely fast. Shop technicians can weld 2-in. diam, 1/16-in. cap to a 1/16-in. Zircaloy cylinder in about 15 seconds. The same weld on stainless steel takes about 12 seconds. Of course, this doesn't include loading and setup, plus pump down time.

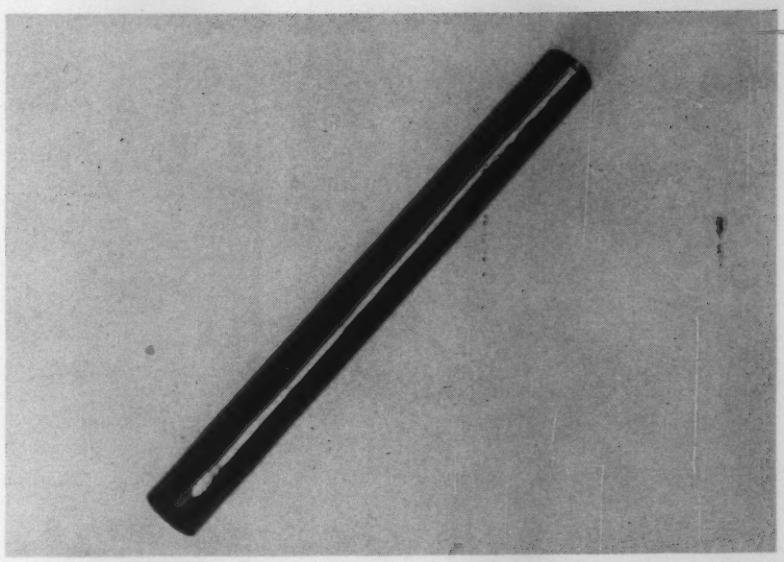
New Wrinkle—The new welders are designed to prevent arcing due to discharges at the weld. This arcing is prevented by separate pumping systems for both the electron source and the welding chamber. It also enables welding of corrugations. Until now, welding on more than one plane was impossible.

An electromagnetic device in the electron gun provides easy focusing for various beam voltages. In the long run, this permits accurate welding of nonsymmetrical pieces or parts with sharp protrusions.

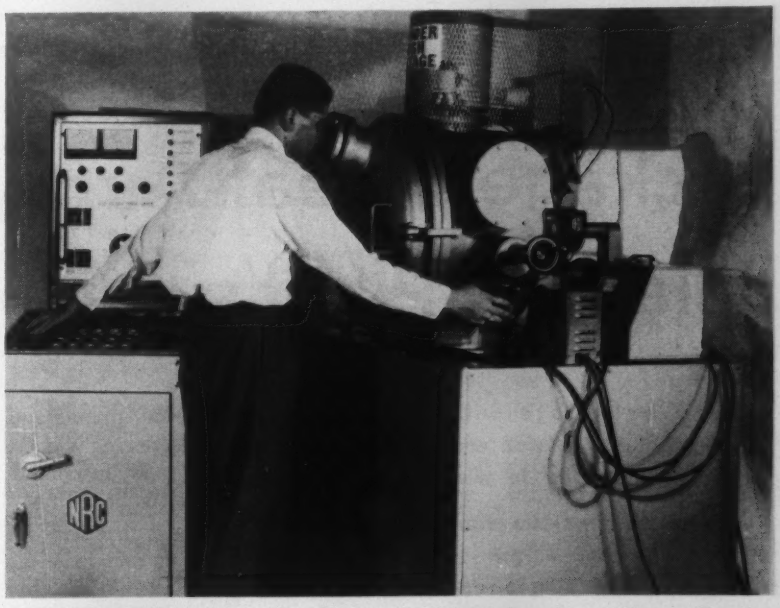
An old pitfall in the operation of electron beam equipment has been the interruptions incurred from high voltage gaseous discharges. A smaller size aperture now protects the gun from these damaging pressure rises. Aside from passing through this aperture, the beam is also focused by it.

The new electromagnetic lens permits focusing by a simple turn of the knob. This should add greatly to the future use of the process.

Boiled Down — Electron beam welding is best defined by two of its traits. First, temperatures it can produce are boundless, limited only by cost, life and operating voltages. And second, there are no gases shielding the weld zone which might contaminate the metal.



CRITICAL BUTT WELD: Electron beam produces critical weld on 0.010-in. thick tungsten tube, a natural application for such equipment.



PROPER FOCUS: Manual adjustment of focal length and linear location of work prepares electron beam unit for circular welding.

Hence, when these conditions are needed to secure a good weld, electron beam equipment should be used. When these factors are not vital, it's best to use other processes. They'll be cheaper in price and will do just as well.

Lacking are data on welding techniques and equipment settings for certain metals. For instance, there's very little data on recommended voltages, beam currents and welding speeds.

That means the user must establish his own machine settings through trial and error. It isn't hard to do, but it does take time. As a result, most welders produced to date have gone into research labs in both government and industry.

PACKAGED AIR: Warm-air supply on roof embodies many special features. Plant project engineer Marko Bobaljik and Paul Gancia of Metals Engineering review requirements at completion of installation.

Packaged Heat-Air System Balances Plant's Air Supply

Adding exhausts without boosting air supply can create problems, especially in winter.

Working in a partial vacuum affects worker output and morale. There's a simple remedy in roof-mounted heat-air units.

By R. H. Eshelman,
Machinery Editor

▪ Air starvation in metalworking plants is a growing problem with so many processes requiring exhaust. You have direct exhaust systems for grinders, paint spray booths, oil mist, and heat treat setups.

In addition, most plants find general exhaust systems necessary for removal of solvent, plating and other chemical processing fumes, carbon monoxide and machining residues or metal dusts.

The big problem is that removal of these fumes, dusts and toxic air also carries off heat. In cold weather it means you must add both heat and fresh air to balance demand and provide satisfactory plant working conditions.

A Common Problem — "Almost any type of manufacturing plant must face these problems today," notes Carl Simek, Chief Plant Engineer of the Chrysler's Jefferson Avenue plant in Detroit. "We felt we had to find a solution to exhausting of the air supply when we brought together many new body fabrication processes for our 1960 unitized models."

This plant now manufactures unitized automobile bodies for Dodge, Desoto and Chrysler cars. It houses an elaborate new dip-tank operation designed to prevent underbody rust. Virtually every step beyond the forming press requires some type of exhaust system to carry away gases, fumes, dust and vapors.

Sub and final assembly of the 25 different body styles made in the plant take thousands of arc welds. This alone creates acrid fumes that must be immediately exhausted to the outside. The general exhaust system handles this load, moving 150,000 cfm.

Exhausts Add Up—Torch solder-

SIMPLE SHIFT: To divert warm-air flow to another spot inside plant, project engineer Marko Bobaljik slides inside perforated plate on register panel. View shows half of register chamber of one unit.

ing areas require an 80,000-cfm venting system. Likewise, lead grinding operations use an 80,000-cfm exhaust unit. Drive shaft tunnel-deadener spray requires 37,500-cfm exhaust. Bonderizing dip areas, dry-off and bake ovens require additional exhaust systems that tally up to 62,500 cfm.

These requirements all total up to 425,000 cfm that's blown out of the plant at full operation. In warm weather, with windows and doors open, there are no serious difficulties. Replacement air pours in through the openings naturally without need for forced supply.

But the situation quickly becomes critical with a change of weather. Even a big plant, with doors and windows closed, can quickly develop a partial vacuum with this much exhaust.

Pulls a Vacuum — Doors that swing out are almost impossible to open. Workers are subjected to a rarefied atmosphere. These conditions are scarcely conducive to efficient operation or worker comfort.

The switch to unitized body construction brought major plant rearrangement, too. For instance, thermal window fans had furnished ventilation for some of the processes in previous locations.

In the new location and new setup, this kind of arrangement was impractical and inadequate. So a new fresh warm-air supply was used.

Study Solutions—Plant engineering analyzed various methods for meeting this air supply problem. At the outset they rejected steam, since operating and installation costs looked excessive. Also, the possibility existed that it would throw too much load on boilers in severe weather.

Direct-fired gas installation seemed to promise the best solution, both in lower capital investment and less operating cost. Chief engineer Paul Gancia, Metals Engineering and Manufacturing Co., Inc., Detroit, proposed roof-type packaged units.

The principle had proved out on smaller units designed, built and installed in a similar situation. They take up no valuable floor space and, since they are self-contained, it's possible to move them to another site, if desired later.

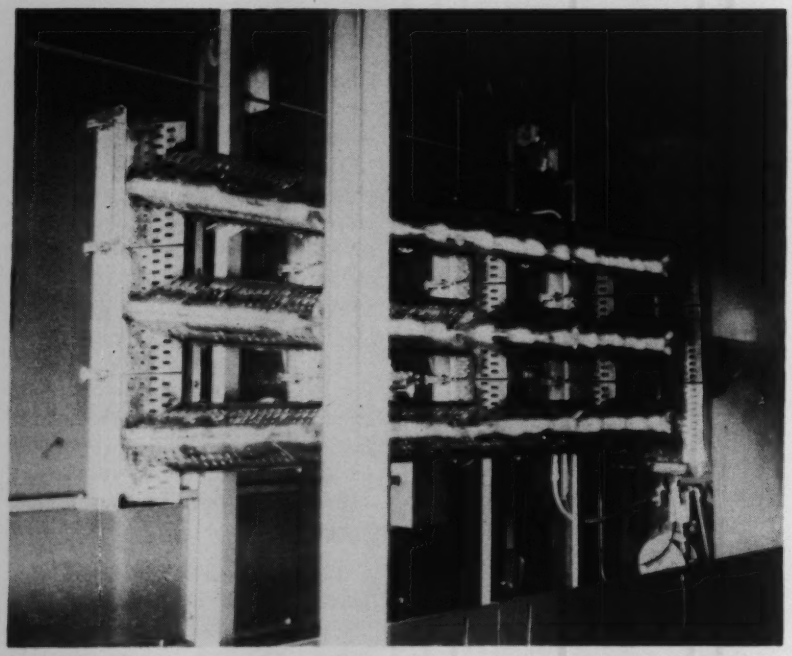
Excess Capacity — In the final setup are three of the packaged warm air supply units, having a capacity of 150,000 cfm each. These are believed to make up the largest direct gas-fired units and together comprise the largest installation of the type made to date.

The engineering firm worked closely with company plant engineers on the project, fusing ideas into a completely automatic setup of high efficiency. It's estimated that operating costs will be only 30 pct of other solutions offered.

The total capacity of 450,000 cfm gives 25,000 cfm excess over exhaust. This extra air helps manufacturing by providing a pressure curtain to contain solvent vapors within spray booths and dip tank canopies.

How It Works — Four-sided louver towers contain the units. They're designed to give adequate intake under any foreseeable weather conditions. No matter what direction the wind blows, volume of

BIG BLOW: Dual fans in cylindrical housing pull air from louver tower down through burner chamber and eject into plant at 75,000 cfm.



HOT AIR SOURCE: Gas-fired Maxon burner in action. Stainless flame guards help disperse 15 million Btu's into airstream.

air needed enters the units freely.

Automatic, motor-actuated dampers below the louver openings seal off outside air when the unit is not operating. They open as the gas flame is automatically ignited.

The design uses a Premix 15-million Btu gas burner in each of the three units. These burners are thermostatically controlled in the airstream beyond the burners. Thus, Btu output automatically decreases as the outside air becomes warmer.

Baffles Protect Flame—Stainless steel baffle wings protect the flame from blowout. They also disperse the heat into the airstream.

Ignition and shutoff is actuated through remote control buttons on the factory floor below each unit. Operation could be entirely automatic; floor control allows any unit to be shut down, or all units to be stopped at the end of a shift or started at the beginning of a shift.

Dual, low-velocity, four-way intake axial fans force air through the burner chamber and into the plenum at a total rate of 150,000 cfm. Fan speed is constant.

Smooth Flow — Wide dispersal and gentle flow of the large volume of warm air into the plant are wanted. This insures worker comfort; prevents interference with operations that might occur from a concentrated blast of warm air.

Spot control of all register areas of the distribution chamber was also desired. Volume of air dispersed into the plant below can be pinpoint controlled.

It's accomplished by discharging the warm air from the plenum into a large exhaust chamber suspended from the plant ceiling. This exhaust chamber has dozens of adjustable 3 x 5 ft registers. They comprise the entire floor area, the wall opposite the plenum, and the two ends.

Advantages of the system are many: lower capital outlay, use of gas—a fuel widely available at low industrial rates; compactness of the roof installation, saving factory floor space, automatic operation; adaptability to all types of plants pinched for air.

New Thread Design Doubles Life Of Nut-Bolt Combinations

High-tensile bolts occupy an important position in today's aircraft programs.

But now they should become even more valuable, thanks to a slight but extremely vital alteration in thread design.

■ A nut and bolt combination doesn't last forever. Sooner or later, the continued effects of fatigue loads will cause the expected fracture of the fastener combination.

This question of failure becomes a serious matter in high-tensile bolts. Where does fracture occur? It rarely if ever takes place in the nut body. Why not? Because this part is loaded in compression.

Failure almost always occurs in the bolt. Specifically, at the first thread in contact with the nut. It's in this area that the fatigue stresses concentrate.

Therefore, anything that can be done to distribute these stresses over a greater number of nut-and-bolt threads should increase the life of the combination. And something has been done to at least double this fatigue life in high-tensile bolts.

Doubled Life—Engineers at Elastic Stop Nut Corp. of America, Union, N. J., have developed a new nut thread design. K. R. Bronson, Head of Research Section, and C. C. Faroni, Chief Product Engineer, were key figures in the new development.

When installed in conventional high-tensile self-locking nuts, it more than doubles the fatigue life of such nut-bolt combinations. How does this design differ from standard thread designs? First, the lower nut threads are more flexible. And second, there's a special small angle countersunk in the bottom.

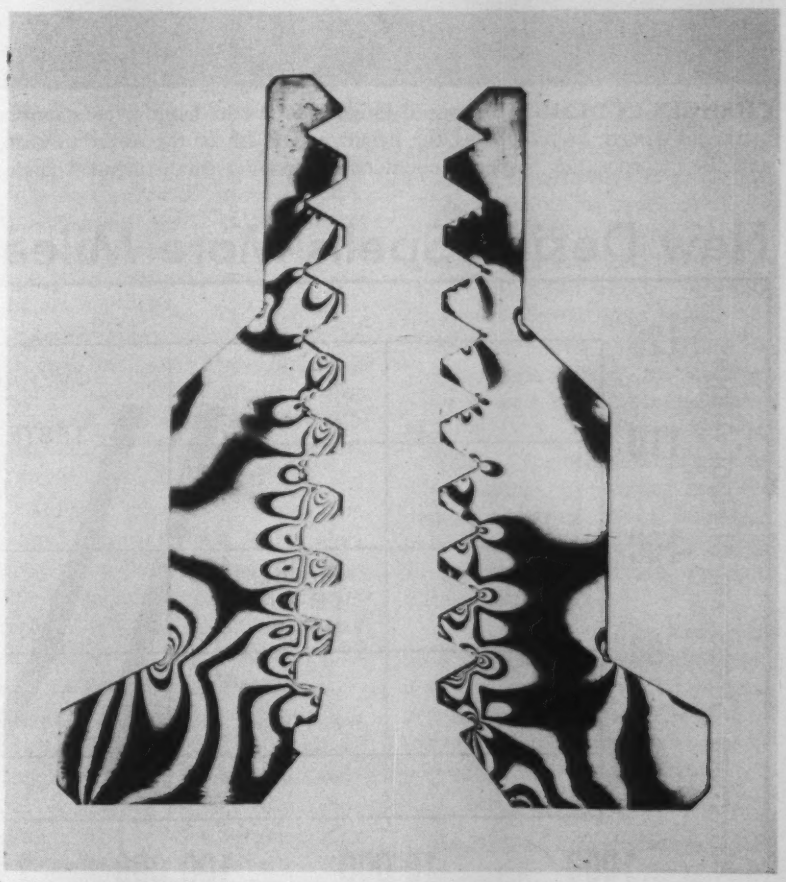
An important feature of the Equa-Stress thread, as it's called, is that it will fit into any conventional or special nut body. In doing so, no changes are required in dimensions, metallurgy, finish or locking performance. Also, the thread remains fully interchangeable with standard parts.

Why They Fail — Researchers have spent countless hours studying the reasons for fastener failures. What happens when a perfectly-matched nut and bolt are put under load points up the problem.

Engineers aren't convinced without real proof. And the proof is there both in fatigue and photoelastic studies.

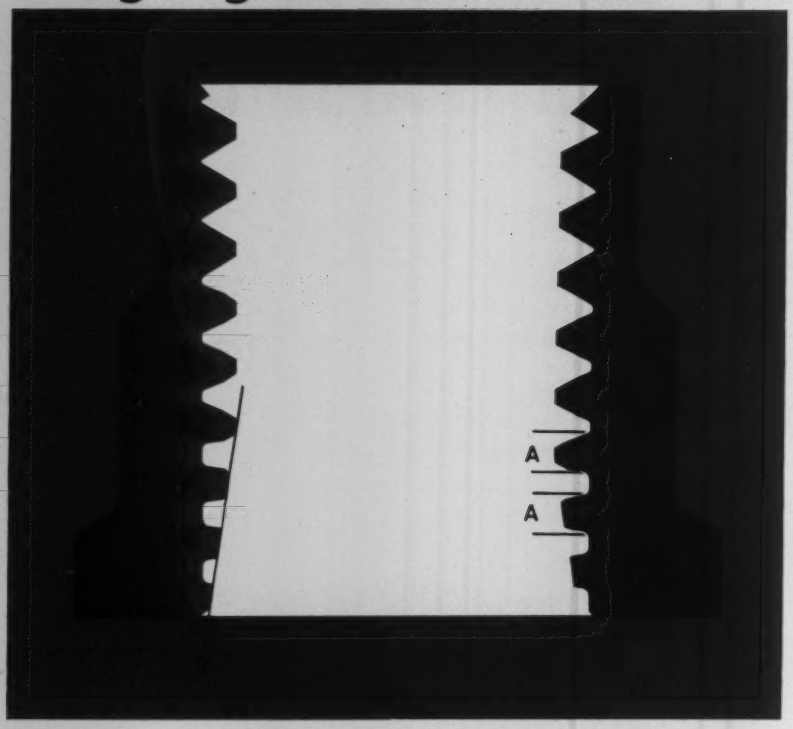
Fatigue tests show that repeated loads on threaded connections re-

How Stress Patterns Compare



RELIEVING THE STRESSES: In standard nuts, high stress loads concentrate on the lower threads. However, photoelastic studies show how the newly-designed threads (left) distribute stresses more evenly.

Designing the New Thread



CHANGES IN DESIGN: Improved fatigue life results from a few changes in thread design: (A) reducing the height and width of the lower threads, and (B) incorporating a special countersink having a small included angle.

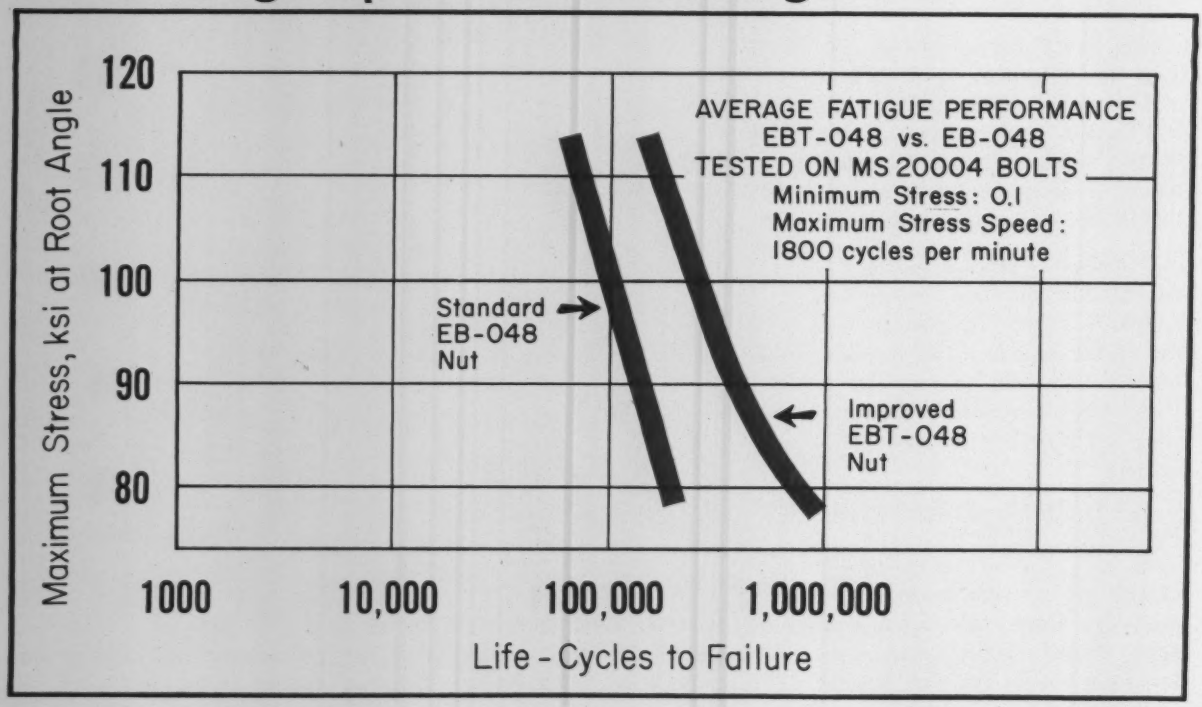
sult in failures at the root of the first bolt thread that is engaged with the nut.

Local stress at this point arises from two tensile stresses. One is in the bolt body. The other is at the thread root of the bolt. The latter stress develops from pressure exerted by the nut. This, in turn, causes a bending of the cantilever thread. It's this bending stress that bears the main effects of load concentration.

Photoelastic studies complete this picture of fatigue failure in conventional assemblies. These studies clearly show that maximum loads tend to concentrate on the lower threads. Photoelastic studies of improved assemblies, on the other hand, disclose that the stresses are distributed evenly throughout a wider range of threads.

What Really Happens — The nut body is subject to axial compression that varies from a maximum at the base to zero at the top. At the same time, the bolt body is exposed to axial tension. This will vary from

New Design Spells More Mileage



a maximum value at the first loaded thread to zero at the first thread above the nut body.

So it really doesn't matter how perfectly the threads are in contact before loading. The opposing axial strains, one compressive and one tensile, still put most of the stress on a single thread near the base of the nut.

Several changes in nut design now prevent these stresses from concentrating in this one area. To make the lower threads more flexible and through slight yielding to pass along a part of their load, research men at ESNA reduced the width of the base of each thread in the lower part of the nut.

The result is a redistribution of the load. As such, the lower nut threads transmit a smaller amount of the load to the bolts.

Multiplying Fatigue Life

Bolt Type	Standard Nut Type	Improved Nut Type	Average Fatigue Life, Cycles		Stress Level Maximum Stress at Root Area, psi
			Standard Nut	Improved Nut	
MS 20005	LH 3393-054	LH 3393T-054	13,000	42,000	127,000
MS 20005	LH 3393-054	LH 3393T-054	33,000	80,000	110,000
MS 20005	LH 3393-054	LH 3393T-054	41,000	368,000	93,000
NAS 629	LHEB 220-098	LHEB 220T-098	28,000	77,000	104,000
NAS 629	LHEB 220-098	LHEB 220T-098	65,000	545,000	86,625
NAS 626	LHEB 220-064	LHEB 220T-064	8,000	18,000	127,000
NAS 626	LHEB 220-064	LHEB 220T-064	27,000	110,000	106,000
NAS 626	LHEB 220-064	LHEB 220T-064	53,000	365,000	86,625
220 KSI	LHEB 220-070	LHEB 220T-070	16,000	124,000	130,000
220 KSI	LHEB 220-070	LHEB 220T-070	66,000	2,000,000	100,000

Design Harmony — A special countersink increases the crest diameter of the lower nut threads. This change doesn't make the threads less flexible. It's merely a device which provides a gradual increase in pitch of the nut threads. It accommodates the growth in pitch that occurs in the bolt threads.

Every test conducted on nuts with the improved thread provided at least twice the bolt fatigue life of standard nuts. Many of them improved fatigue life as much as seven, eight or even twelve times. The average, in fact, was four and one-half times the endurance limit of conventionally-designed nuts.

For industry, this is a big step forward. It means greater fastener reliability. It will cut down maintenance time, too. That means a big decrease in the valuable time spent in "re-tightening."

The new design can even be useful where present fatigue performance is up to par. How? Replace the present fasteners with shorter Double Durability nuts along with bolts having shorter thread length.

Suit Yourself — Suppose you're using a ⅜-in. nut and bolt combination. It's now possible to swing over to a smaller ¼-in. combination. This will not only result in a saving in space but a saving in weight as well.

On jobs where a great number of bolts are needed to provide reliable fatigue joints, you'll be able to get the same strength from a fewer number of newly-designed nuts and the original bolts.

Rather than base its opinion on its own findings, ESNA thought it best to consult an outside testing company. So further tests were carried out by Almay Research & Testing Corp., Los Angeles.

Almay's project: To compare fatigue life of ½ and ¾-in. diam nuts — standard vs. new design. ESNA submitted several different types of self-locking nuts, including samples of its new Double Durability self-locking series.

Samples submitted either had tensile strengths of 180,000 or 220,000 psi. The all-metal nut samples contained a molydisulphide coating. The 180,000 psi series nuts were cadmium plated.

These fastener combinations are all designed for use in the aircraft industry. And the aircraft industry is extremely strict when it comes to quality control.

Wrap-Up—The results were encouraging. The tests showed, for example, that newly-designed nuts of the 180,000 psi series produced an average fatigue life of 201,666 cycles. Compare this figure with the 27,333 cycle average for standard nuts. Seven times better.

Another nut, in the 220,000 psi series, outperformed its standard counterpart 4.8 to 1. Average cycles to failure were 172,666 to 35,666.

Almay engineers summed up their findings by stating that the nuts of improved design developed higher fatigue life of high-performance aircraft bolts than standard self-locking nuts.

Although uses to date have been tailored to fit aircraft applications, it should only be a matter of time before these new designs lend their support to other industries—just as important as the aircraft field.

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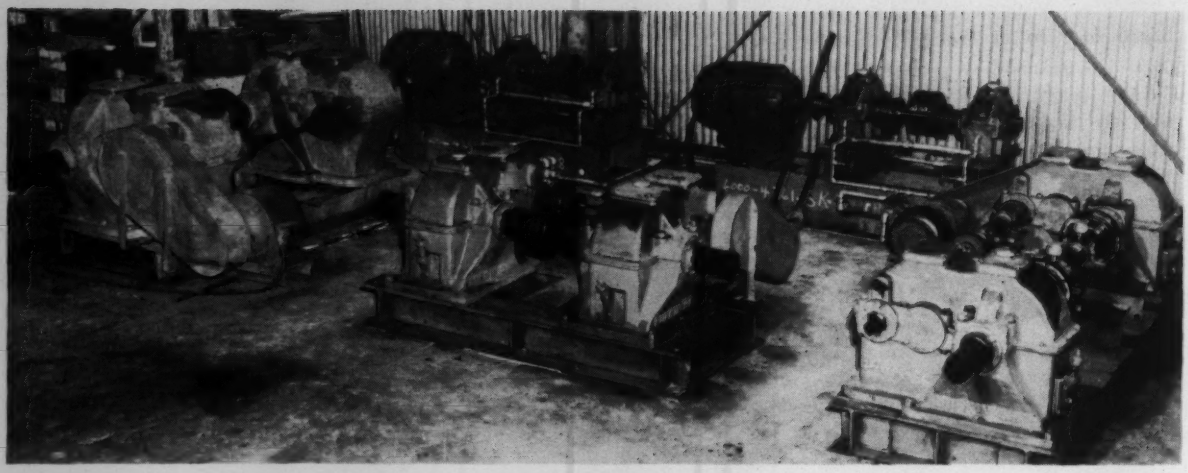


TEST SETUP: Nodular iron and steel gears operate in duplicate housings linked to come under identical loads.

Nodular Iron Gears Stand Up To Overloads and Rough Use

Instead of rating below steel gears in performance, nodular iron gears are proving themselves equal to the toughest applications.

▪ In both experimental and production use, nodular iron gears are turning up evidence that they can give service equal to that of steel gears with no loss in load-carrying ability.

While it once was suggested that nodular iron gears be derated from 10 to 22 pct below steel, there's reason to believe that nodular iron gears are as good as steel gears from the standpoint of pitting, scoring and beam strength. This is reported in a recent paper by Bayo Hopper, Chief Engineer, Lufkin Foundry & Machine Co., Lufkin, Tex.

Years of Testing — During nine years of laboratory load tests, work was directed toward studying the relative performance of nodular iron and steel gear teeth under overloaded conditions. Test gears were of commercial speed-reducer quality, assembled in standard housings.

The setup operated under locked-torque load, with nodular iron gears in one housing and steel gears in the other. In this way the two materials came under identical load conditions.

Results and conclusions are based on visual evaluation. The gears were overloaded so that there would be tooth deterioration for comparative rating.

Control Conditions — The two pinion shafts are coupled together with a slender torque shaft. A weight is used to apply a measured amount of torque.

By bolting the high-speed couplings together, there's a static torque load on the gear teeth. At operating speed, the gear teeth are actually delivering the horsepower indicated by the speed and torque load on the teeth. The driving motor has only to overcome the frictional resistance in the two gear units.

In all the various tests, in which gears took various degrees of overload at selected speeds and load cycles, the nodular iron gears gave results equal to or better than their steel counterparts.

Record in the Field—In addition to these test setups, Lufkin has over 900 nodular iron gears installed in enclosed speed reducers driving oil field pumping units. Of these, only one is known to have failed.

This was a rim failure that occurred after two years of service. In this unit, two sets of steel gears had previously failed after six months each.

While the reducer was rated at 40,000 in.-lb torque, actual peak torque load was 78,000 in.-lb, an overload of 95 pct. Gear hardness was 270 Bhn.

Gear Ages Well — In another case, a nodular iron gear of 240 Bhn has been in continuous operation for seven years. This gear has a peak torque rating of 33,700 in.-lb and is subjected to an actual load

of 60,000 in.-lb, an overload of 78 pct.

This gear has gone through inspection and load checking five times during the past seven years. Some of the initial pitting has smoothed out and the teeth look better now than they did a few years ago.

A leading manufacturer of reciprocating pumps has installed several hundred nodular iron gears. As replacements for alloy cast iron gears, they have eliminated gear problems.

Design Benefits — They've also eliminated bearing problems caused by metal particles from cast iron teeth being circulated by oil through roller bearings. Now it's no longer necessary to seal off the bearings from crank case oil and lubricate them separately.

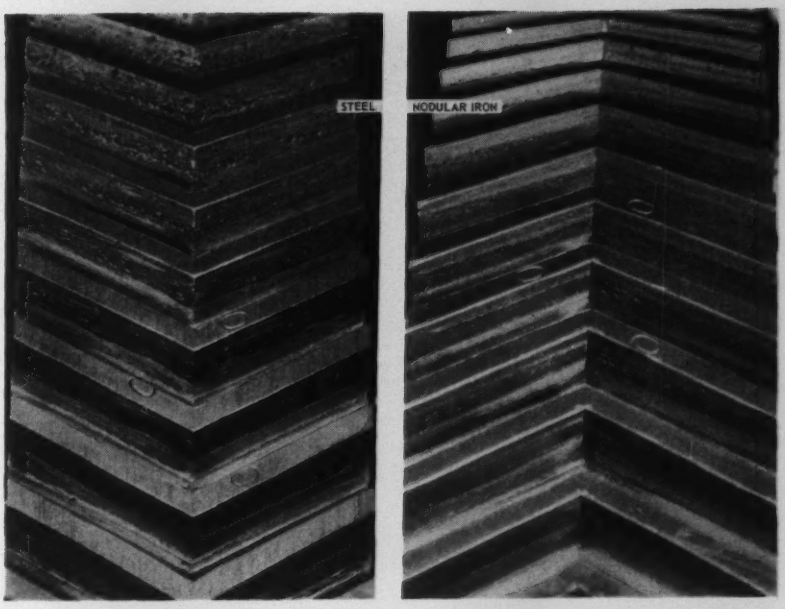
A maker of large presses of 400 tons and up has been using nodular iron drive gears for eight years. Results have been excellent with never a replacement or failure.

A recent inspection of the gearing in one of these older presses revealed the teeth to be in perfect condition. Due to the cyclic nature of loading on presses, these gears are designed more for strength than for surface durability.

Maintenance Saver—In the case of 13-in. diam nodular iron spur gears driving the cutting drums on a multi-wall tubing machine for a paper manufacturer, these gears have taken rough service for five years. The cast iron gears originally used had a normal life of three to four weeks. They broke as often as three times a week.

Steel gears were tried with the result that breakage was eliminated, but rapid tooth wear took place. Carbon steel gears lasted six to seven weeks, alloy steel gears, 10 to 11 weeks. Even after five years, the nodular iron gears are expected to last for some time before replacement.

Another type application which has attracted gear users is where the dust from cast iron gears is undesirable.



DIRECT COMPARISON: Both gears show pitting, but pits in nodular iron gear are neither as numerous nor as deep as those in the steel gear.

HIGH TORQUE LOAD: Nodular iron main gears for 2700-ton press are designed for strength rather than surface durability due to cyclic loading.

One Lever Controls Turret Lathe

New Machine Gives Operator More Cutting Time

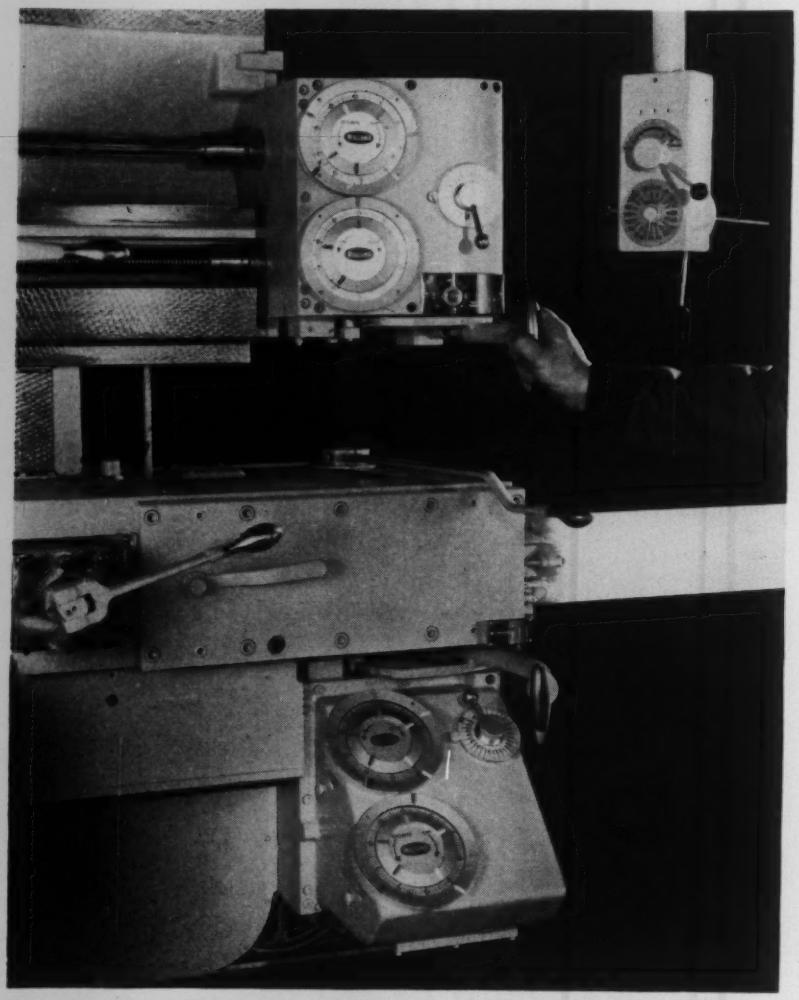
With more and more emphasis on getting higher productivity from new machine tools, the Bullard Co. redesigned its line of vertical turret lathes to do just that.

A single-lever power control cuts downtime and makes operation a simple matter.

▪ A new line of vertical turret lathes incorporates recent advances in machine tool design to provide increased efficiency by: keeping the tool in the cut more of the time—thus shortening the time between cuts — and increasing operating speeds and production rates.

One of several new provisions is a single-lever control. It positions each of the heads and engages or disengages the tool from the work. This cuts down the non-productive portion of the operating cycle, making these functions easier for the operator. End result is that far more manhours are spent actually cutting.

Inexperienced personnel handle these entirely new machines, manufactured by the Bullard Co., Bridgeport, Conn., with short training. The average training period is approximately one half hour.



QUICK ACTION: One lever controls directional motion of the heads. All table speed changes are controlled from the pendant.

Flexible Feeds—Another provision is that the feed rates are coupled directly to the table speed. And they are infinitely variable throughout the full range of the machine—rather than step-by-step selection. This permits the lathes to run at all times at the best cutting rate suitable to the material and tool in use.

The feed rate can be varied while cutting without stopping the table. Thus, without stopping, changes can be made to adjust for tool wear or to match changes in stock removal conditions.

Rapid Positioning—The single-lever control system positions each of the heads. It engages or disengages the tools in an extreme departure from the handwheel and toggle-lever systems. Designed to make the operator the master of his machine, it places in his hands —in the most simplified form—all controls. This control center allows him to start and stop the table, traverse the heads, and engage the cutting tools.

Using this lever control system and its visual indicators, the operator moves the heads to the proper position faster and with more confidence. He puts the cutting tool close to the work before engaging the feed. Then he sets the table in motion smoothly. All these functions are handled from one easy-to-reach position.

Pistol Grip—In the smaller machines, the lever control consists of a swinging (horizontal) arm with a pistol shaped grip. Turning the grip changes the direction of head movement. Pointing the grip to the right traverses the head to the right. Turning it upward, or downward, or at a 45° angle, traverses the head in the same direction.

With the grip pointed in the direction of desired traverse, the arm is then swung to the left to actuate the head. The head traverses at an infinitely variable rate from 0 to 9 fpm. Traversing rates vary in proportion to the distance the lever is moved from the neutral position.

After the head is brought close to the work by the traverse motion, the operator engages the feed by swinging the arm all the way to the right.

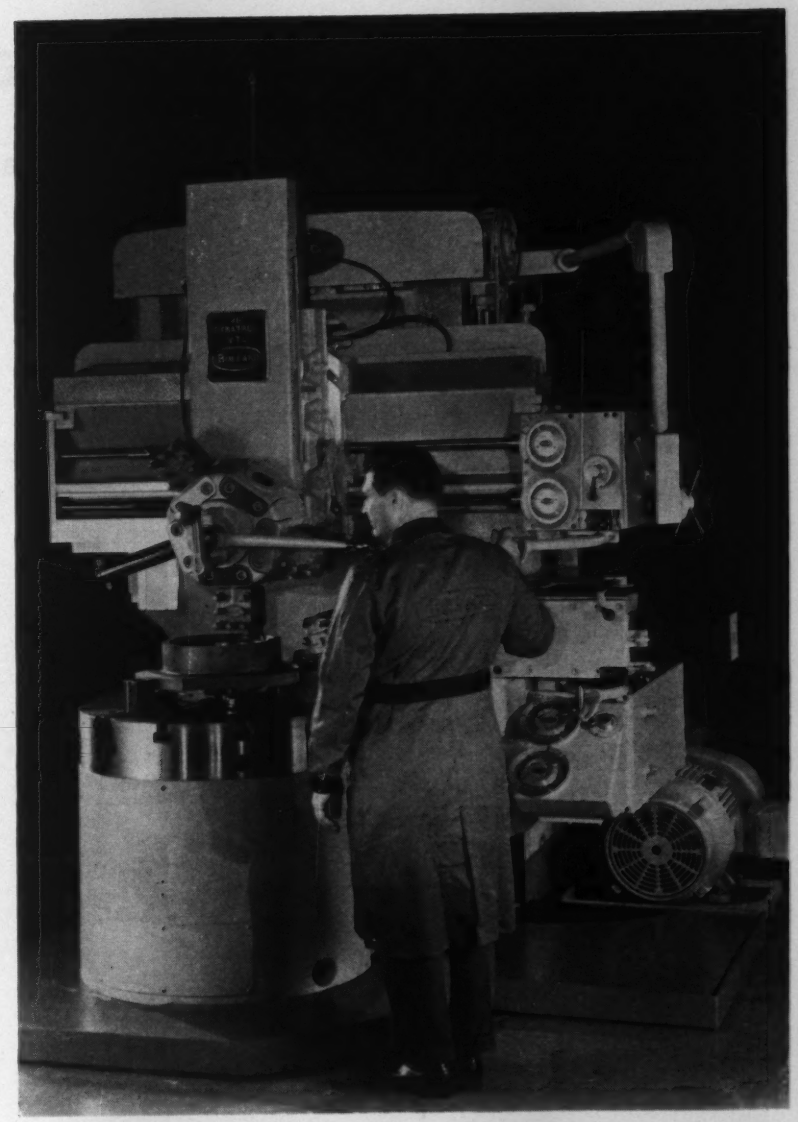
Remote Control — Larger machines have a remote control based on the same operating principle. A control pendant permits the operator to regulate table movement, start, stop or inch, and select speed. Speed is indicated by a light at the correct position on a circular dial mounted at the right end of the cross rail.

In addition, the operator can control the heads from a compact, lightweight box that he holds in his hand. Coded buttons on this box control starting or stopping of the table.

Four more buttons, arranged diamond fashion, permit the operator to select the direction of head traverse. A single lever traverses the head when moved to the left or engages the head feed when moved to the right.

Four Traverse Rates — As he moves the lever to the left, the operator traverses the head at any one of four rates: 9 fpm, 4 fpm, 1 ipm, and the inching rate. The rate of traverse varies automatically according to the distance the lever is moved from the neutral position.

Direction of traverse is regulated by pressing a coded button—corresponding to up, down, right or left. Pressing two adjoining buttons at the same time produces head movement at 45°.



POWER CONTROLLED: This 36 in. vertical turret lathe illustrates the new line. Table diameters range from 26 to 124 in.

Unique Measuring System—Measurements are indicated on large clock-type dials with dual pointers. Graduations and numerals remain stationary while the pointers rotate: one registers tenths of an inch and the other reads in thousandths for close head positioning. This measuring system allows exact head positioning in either feed or traverse—without handwheels.

In positioning the heads to the desired point, the operator watches the movement of the pointers around the dial, rather than the tool motion toward the work. He moves the head rapidly at first; then he slows it down and stops its traverse just as the pointers reach the proper reading on the dial.

Using the dial in the same manner, he measures the progress of the cut which indicates when the feed should be disengaged.

The manufacturer has designed this entirely new line of equipment for complete versatility—in manual and automatic operations.

Sheath-Tube Forms Cast Passage

Stainless Sheath Over Copper Tube Replaces Sand Core

Copper tubes, covered by thin stainless sheaths, form internal passages in magnesium castings.

Acids dissolve the copper tube; allowing easy removal of the flexible cover sheath.

▪ A removable coring cover, made of stainless steel braid, provides complex internal passages in magnesium castings. Use of this coring principle eliminates costly machining and external piping. The as-cast passages provide oil, fuel, coolant or hydraulic systems fluid.

Cast passages branch in almost limitless configurations. Weight is saved because all the core is removed; thus the entire casting is lightweight magnesium — with no foreign matter.

This process, patented by the Howard Foundry Co., Chicago, also reduces the number of voids (or blows) in castings. It even upgrades scrap value. If a casting is scrapped, the reclaimed metal is pure.

Vent Gases—A problem arose during efforts to improve magnesium castings for aircraft fuel control blocks. Gases form when hot metal touches an organically bonded core. It's difficult to vent these gases with standard sand cores.

If the gases can't escape, they bubble through the casting metal. This causes internal bubbles known as blows.

Another problem is that long, thin sand cores often distort during the curing process.

To lick these problems, foundrymen often replace sand cores with copper tube cores. They bend the copper tubes to the desired shapes. After casting, the tubes are usually left in place.

But, if weight is a major problem, the tubes must be dissolved.

Stainless Over Copper—To solve the weight problem, Howard uses unique cores. These cores consist of a stainless steel braided sheath over copper tubing.

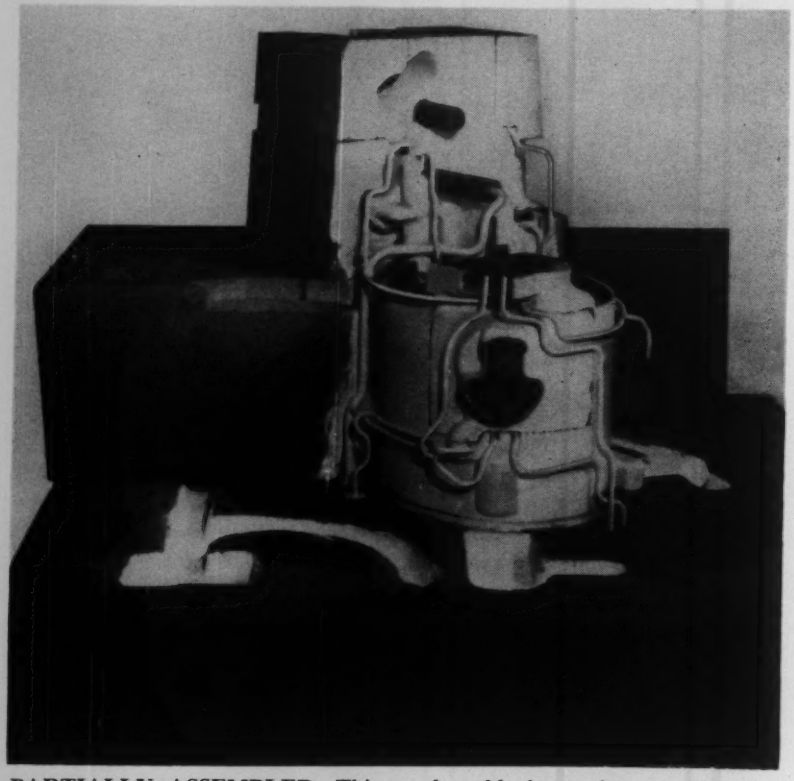
After the casting is poured and cools, a 50-50 mixture of nitric and hydrofluoric acids dissolve the copper. A foundryman then pulls out the flexible steel sheath.

The National Standard Co., Niles, Mich., makes the cover braid. They start with 0.0036-in. diam Type 304 stainless steel wire. This small diam wire provides flexibility in the finished braids. The ⅜-in. diam braided sheath passes through a ⅛-in. hole.

Standard Sheath—A number of wires, braided together, form the sheath. Howard uses six sizes for cores from ⅛ to ⅜ in. diam.

They obtain intricate, curved passages in magnesium castings. Restrictions imposed by drill jobs disappear. Savings, all along the operation, are high.

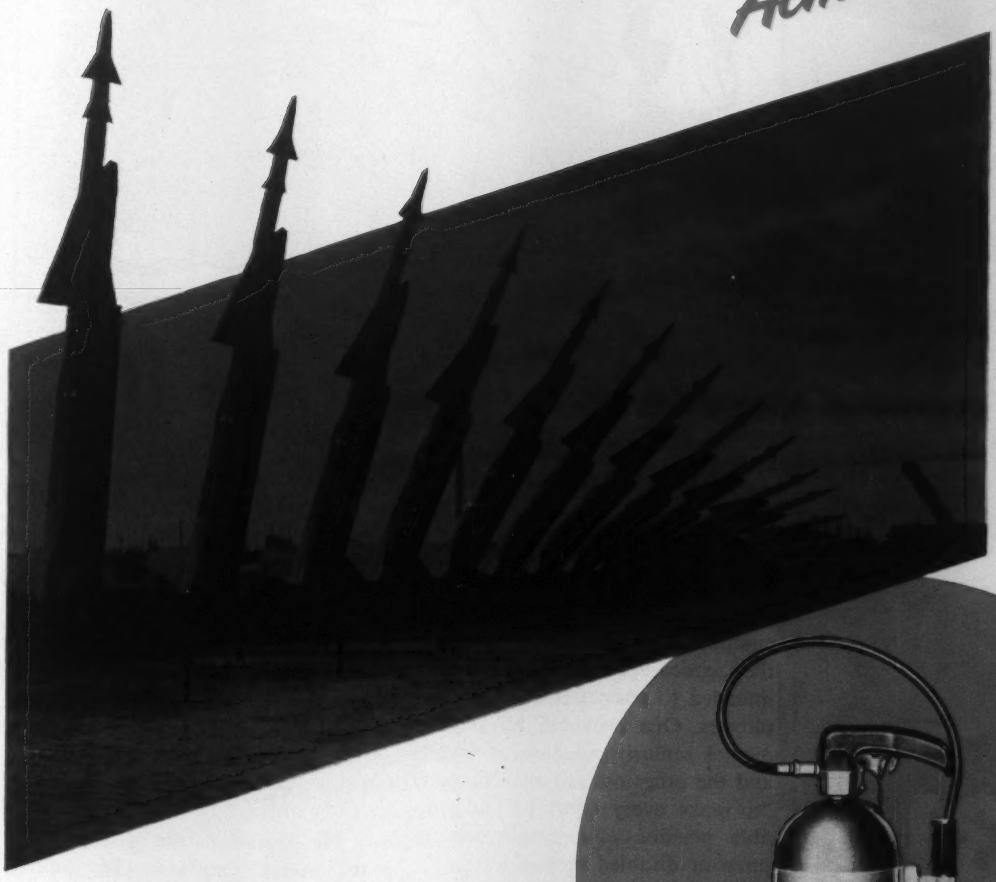
A bending fixture facilitates shaping the copper tubes, prior to covering with the sheaths.

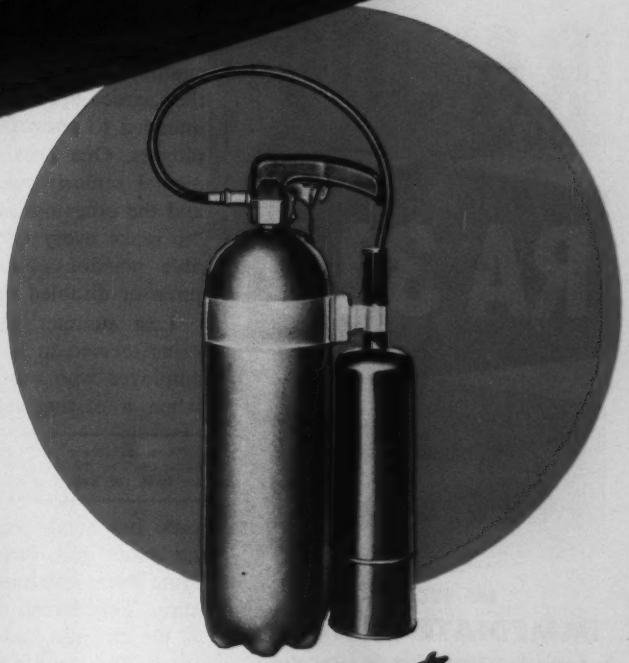


PARTIALLY ASSEMBLED: This sand mold shows the complex core pattern. Thirteen core tubes, covered with stainless steel braid, form hydraulic passages in the casting. Total core-passage length is 10 ft.

FOR PREVENTION OF FIRES AT HOME AND ABROAD

Acme-Newport Steel





Alloys from Acme-Newport become component parts of rockets, missiles and planes that discourage hot wars. Other steels, capable of severe deep drawing, form shells for earth-bound fire extinguishers in home and industry. And a thousand other products in between. After 75 years this basic steel producer has the knowledge, the personnel and the facilities to provide exceptionally good alloy and carbon grades in plate, sheet and strip. Absolute adherence to specifications is a way of life at Acme-Newport at a time when highest quality is essential to today's industry and tomorrow's very existence. Acme-Newport steel is for *you!*

Acme-Newport Steel COMPANY

NEWPORT, KENTUCKY

A SUBSIDIARY OF ACME STEEL COMPANY

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You Arbitrate It!

CONFLICT OF CAUSES

From the files of
The American Arbitration Association

▪ When union and management negotiated a contract at an office equipment manufacturing company, they agreed upon two major clauses intended to protect the jobs of employees. One provided for departmental seniority in case of layoffs and the other obliged the company "to make every effort to find suitable positions for employees injured or disabled on the job."

Last summer these two provisions seemed to be in conflict. An employee who was injured slightly when a casting fell from a shelf onto her hand, was transferred to an easier job, one she could operate while her hand was still in a sling. This forced the displacement of the girl who had been doing that work. The trouble was that the displaced employee had more seniority than the injured one. Naturally, she filed a grievance.

Make-Work Project—The company's defense was that the job the injured worker was transferred to wasn't really "necessary"; the senior employee would have been laid off anyway. It was a "make-work project to accommodate the disabled employee in line with the contract."

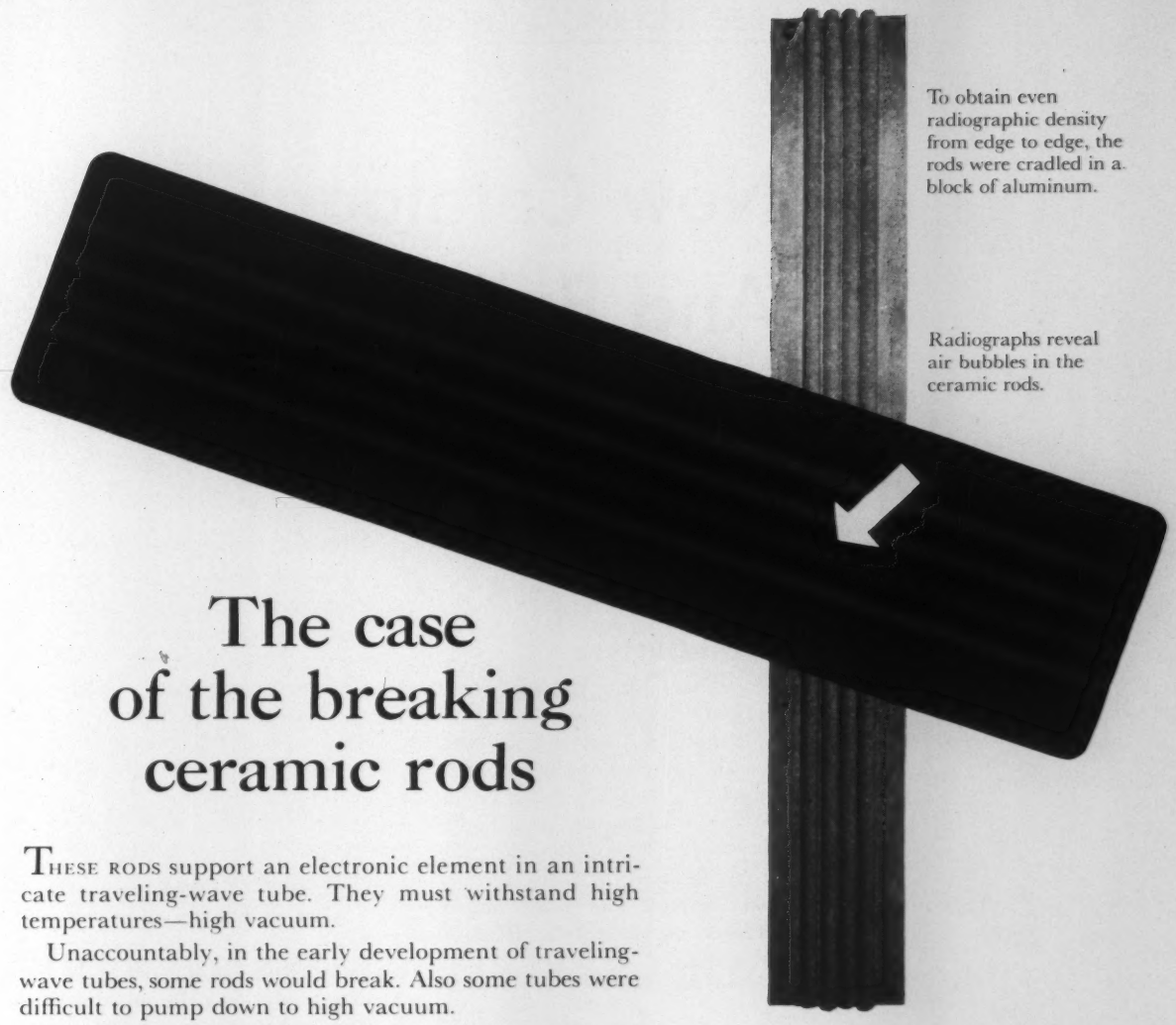
Eventually the case went before an arbitrator selected from the panels of the American Arbitration Assn. to determine which provision of the collective bargaining agreement applied. How would you rule?

"You Arbitrate It!" appears in the second issue of The IRON AGE each month. Look for it in the February 11 issue.

The Arbitrator Ruled:

He sustained the grievance of the senior employee. He added, "There is no controversy over the employer's right to discontinue a part of its operations and lay off the employees involved. But if the employer decided to continue the operation, even though it may in some managerial sense be 'unnecessary,' assignment of employees to the operation must accord with the seniority requirements of the agreement." In short, he said, the company's obligation was to do everything it could to find "suitable positions" for injured employees as long as the seniority provisions were observed.

CAUTION: The award in this case is not necessarily an indication of how arbitrators might rule in apparently similar disputes. Each case is decided on the basis of the particular history, contract, testimony and other facts involved. Some of these essential details may have been omitted in condensing the original arbitration for brief presentation.



To obtain even radiographic density from edge to edge, the rods were cradled in a block of aluminum.

Radiographs reveal air bubbles in the ceramic rods.

The case of the breaking ceramic rods

THESE RODS support an electronic element in an intricate traveling-wave tube. They must withstand high temperatures—high vacuum.

Unaccountably, in the early development of traveling-wave tubes, some rods would break. Also some tubes were difficult to pump down to high vacuum.

To find the reasons, Sperry Gyroscope Company turned to radiography.

The radiographer employed a filter device to obtain even density from edge to edge of the radiographic image of the rods. The defective rods were found to contain tiny air bubbles which expanded when the tube was heated and caused the breakage. They also were the cause of the difficulty in degassing the tubes.

In the inspection of assemblies, of castings, of welds, radiography provides a reliable means of examining internal conditions and making sure that only high-quality products are delivered. Often it suggests ways of improving manufacturing methods and cutting costs.

Would you like to learn how radiography can work profitably for you? Talk it over with an x-ray dealer or write for a Kodak technical representative to call.

Read what Kodak Industrial X-ray Film, Type AA, does for you:

- . . . Speeds up radiographic examinations.
- . . . Gives high radiographic contrast, increased detail and easy readability at all energy ranges.
- . . . Provides excellent uniformity.
- . . . Reduces the possibility of pressure desensitization under shop conditions.

X-ray Division

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

Kodak

®25,000:1 This fantastic ratio is possible only at Somers, where the latest equipment produces thin strip down to .001", as wide as 25".

With the installation of one of the largest Sendzimir mills in the non-ferrous industry, Somers is prepared to meet the broadest range of dimensional specifications, since it is already supplying thin strip down to .0001" in narrower widths.

Pure Nickel, Monel, Inconel and Inconel "X" are produced in gauges from .0001" to .020". Stainless Steel, electrolytic Copper and its alloys, such as Brass, Nickel Silver and Phosphor Bronze from .0001" to .010".

For a complete survey of your strip problems at no cost or obligation, write for field engineer or Confidential Data Blank.

Somers Brass Company, Inc.
102 Baldwin Ave. Waterbury, Conn.

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 85.

Radii-Cutters

Cut and form spherical shapes accurately and economically with a Radii-Cutter. These units are attached easily to the compound of any lathe. They may also be used on turret lathes and some milling machines. The special cutter eliminates the need for costly form tool bits, multiple tool setups and repetitious measurements. (Holdridge Mfg. Co.)

For free copy insert No. 1 on postcard, p. 85

Conveyor Lubricator

A new model conveyor lubricator has a universal head that will pick up trolleys of various makes on the same conveyor. A self-contained unit, it is mounted on the trolley rail and actuated by the moving conveyor to perform either oil or grease injection. It operates on plant compressed air. (J. N. Fauver Co., Inc.)

For free copy insert No. 2 on postcard, p. 85

Magnetic Separators

Design and operating advantages of high pressure magnetic separators for hydraulic systems are outlined in a four-page bulletin. Types described are the industrial PH series with working pressures from 2000 to 5000 psi, and the aircraft PX series with working pressures up to 3000 psi. (S. G. Frantz Co., Inc.)

For free copy insert No. 3 on postcard, p. 85

Stress Relieve Welds

Unusual stress relieving jobs, which were accomplished with 400 cycle high frequency heating equipment, are illustrated and described in a three-page folder. The portable induction heating equipment stress relieves welded joints in hard-to-get-at places. (Hobart Brothers Co.)

For free copy insert No. 4 on postcard, p. 85

Punch Presses

A short bulletin illustrates and describes an extensive line of punch presses from 2 to 18 tons. The bulletin shows deep throat, universal, slow-speed, vari-speed and special series presses which are designed for multiple production operation. (Kenco Mfg. Co.)

For free copy insert No. 5 on postcard, p. 85

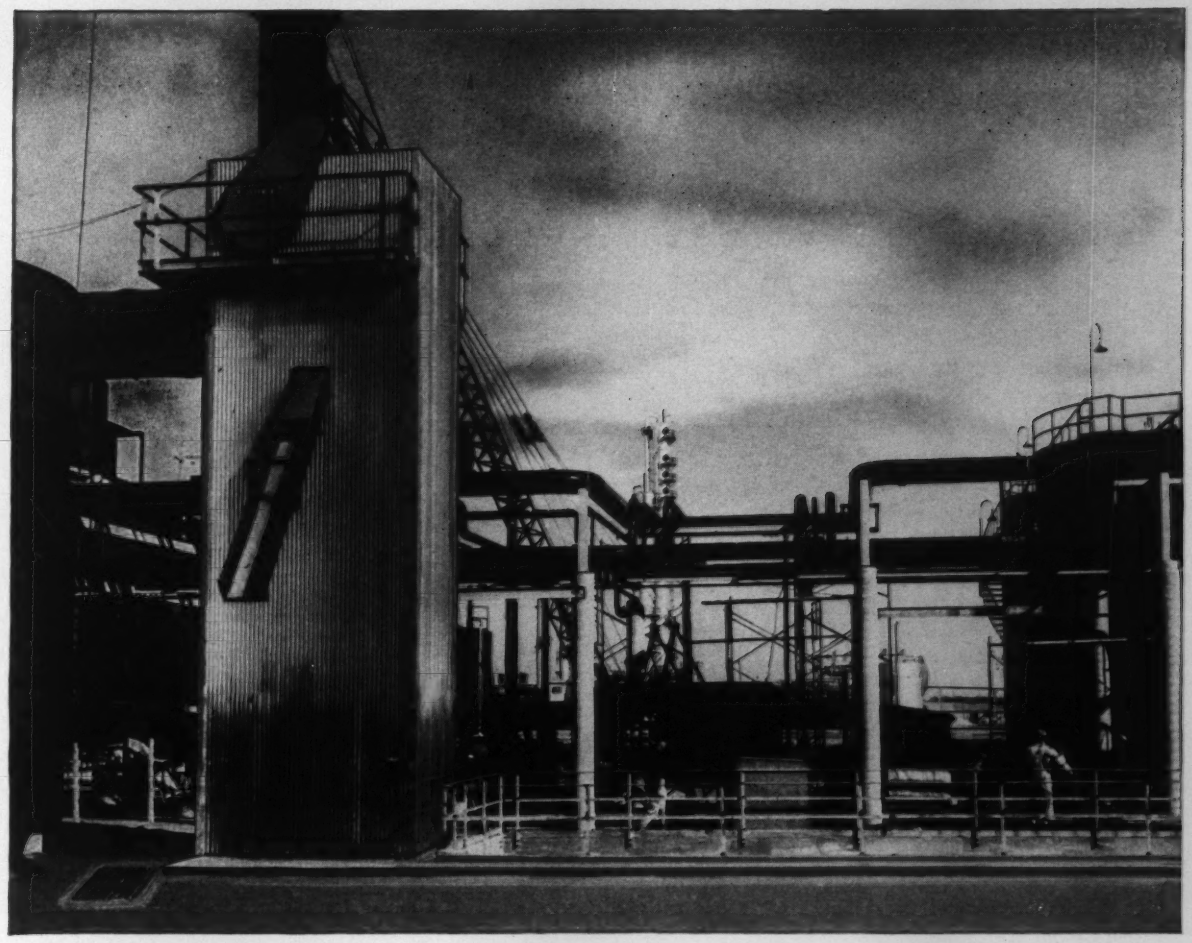
Isolate Vibrations

Isolate shock, vibration and noise caused by impact, rotating and reciprocating machines. A bulletin covers isolator mounts and describes how to select isolators for vibration isolation applications. (Barry Controls, Inc.)

For free copy insert No. 6 on postcard, p. 85

Thermocouple Catalog

A complete line of industrial thermocouples, thermocouple wires and protecting tubes, lead wires, insulators and accessories are described in a 16-page catalog. Either



Jeffrey system recovers coke fines at Skelly refinery

Petroleum coke, manufactured from reduced crude oil, is an important by-product at this new Skelly Oil Company refinery—important enough to justify recovering the fines dropped when railroad cars are loaded with the material.

The ½" x 0 coke fines, weighing 50 pounds per cubic foot, are washed up in water, which then pass through a settling tank. As the fines drop to the bottom of the tank, a continuous V Bucket Collector removes the fines, conveys and elevates them at rates up to 6½ tons per hour.

Jeffrey designed and built this recovery system, drawing on its broad experience in treatment of water, sewage, and industrial waste. If you have a similar problem, where valuable materials can be recovered, contact Jeffrey. The Jeffrey Manufacturing Company, 925 North Fourth Street, Columbus 16, Ohio.

Jeffrey V Bucket Collector recovers coke fines from settling tank at Skelly Oil Company refinery, El Dorado, Kansas. The system also permits re-use of the water.

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT...TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

RANSBURG

What Would Paint Savings Like This* Mean in YOUR Finishing Department?

Quality is all important in the production of fine Metalcraft furniture by George Koch Sons, Inc., Evansville, Indiana.

That's why they use the Ransburg Electrostatic Hand Gun to apply a uniform clear coating on their brass-plated furniture. The protective coating is baked on. Although the bulk of their present production is in the popular brass line, they still paint the metal furniture in a variety of colors with the Hand Gun.

Painting is CLEANER ... QUICKER ... CHEAPER *with the Ransburg Electrostatic Hand Gun.*

These chairs and table are typical of the Koch line of metal furniture.

*10 GALLONS OF PAINT NOW DOES THE JOB WHICH FORMERLY TOOK 30 GALLONS

On one item—a TV table—they formerly used 30 gallons of enamel to coat 1000 units by combination dip and air spray method. Now—with the Ransburg Electrostatic Hand Gun, they paint 1000 tables with only 10 gallons. And, they get a better, more uniform coating, too.

NO REASON WHY YOU CAN'T DO IT, TOO!

See how the Electrostatic Hand Gun can save time . . . paint . . . and cut costs in YOUR finishing department. Or, if your production justifies, it'll pay you to investigate Ransburg's automatic electrostatic spray painting equipment. Write for our No. 2 Process brochures which show numerous examples of modern production painting in both large and small plants.

RANSBURG

RANSBURG
Electro-Coating Corp.
Box-23122, Indianapolis 23, Indiana

FREE LITERATURE

base metal or nobel metal thermocouples can be inspected in 20 seconds. Elements are replaced in 45 seconds. (Arklay S. Richards Co., Inc.)

For free copy insert No. 7 on postcard, p. 85

Scarfing Torch

A hand scarfing torch employs a universal mixer enabling it to operate on either acetylene or fuel gas. For removing surface defects from steel ingots, billets, blooms, and slabs prior to final rolling, it is ideal for use on large seamless steel rounds. Available in three lengths, it is ruggedly constructed for long, trouble-free operation. (Linde Co.)

For free copy insert No. 8 on postcard, p. 85

Shear Knives

Descriptive sections on each of six grades of shear knives, together with recommendations for their specific use, appear in an illustrated brochure. A full line of shear knives for all metalcutting applications, along with rotary slitter knives, punches and dies, is described and pictured. (American Shear Knife Co.)

For free copy insert No. 9 on postcard, p. 85

Layout Machine

A linear attachment measures layout machine movement and can be used to lock the machine to the table at any desired position. Typical layout procedures for castings are illustrated and detailed in a short bulletin. (Portage Double-Quick, Inc.)

For free copy insert No. 10 on postcard, p. 85

Self-Locking Nuts

A locking pin, built into the nut, travels between bolt threads. It assumes a fixed angle and sets up a point of impingement against the bolt. Thus, a secure anchorage against shock and vibration is maintained. A bulletin outlines advantages and provides illustrations. (The Automatic Nut Co.)

For free copy insert No. 11 on postcard, p. 85

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Machine Tools

A 16-page catalog covers various models of Bore-Matics, internal grinders, rotary surface grinders, tool sharpeners, boringheads, wheelheads and attachments. A short description of each model is given. (The Heald Machine Co.)

For free copy circle No. 21 on postcard

Improve Packages

Suggestions for proper loading, handling and closure of cartons, to insure maximum cost reduction and better package quality, are presented in two brochures. The six-strip and the two-strip sealing methods and their relative costs and proper usage are covered. (Mid-States Gummed Paper Div., Minnesota Mining & Mfg. Co.)

For free copy circle No. 22 on postcard

Prestressed Concrete

A 16-page engineering data bulletin describes force development calculations, detailing and placement plans, tendon and anchorage assemblies, stressing and grouting equipment, and field labor procedures for cast-in-place and precast post-tensioned concrete construction. (Joseph T. Ryerson & Son, Inc.)

For free copy circle No. 23 on postcard

Gear Presses

Two and four point eccentric gear presses in capacities from 100 to 1500 tons are illustrated and described in a 12-page bulletin. (The Federal Machine and Welder Co.)

For free copy circle No. 24 on postcard

Marking Pencils

A marker for every purpose and on every surface is featured in a complete marking bulletin. Specific marking pencils are used for marking metals, china, glass, skin and textiles. (Blaisdell Pencil Co.)

For free copy circle No. 25 on postcard

Automatic Profiler

An all-new tracer-controlled milling machine follows an easily prepared sheet steel template to quickly and accurately produce any two-dimensional shape. Straight lines and irregular contours, either external or internal are machined with equal speed and efficiency. A circular describes the machine. (Pratt & Whitney Co., Inc.)

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Electric Power Plants

Electric plants for stand-by or sole supply are illustrated in a 12-page folder. Sizes range from 500 to 100,000 w. (Kohler Co.)

For free copy circle No. 27 on postcard

Dished Grinding Wheel

Intended and written as an aid to those with grinding wheel problems, a short brochure provides an informative, illustrated work that contains all design characteristics and safety features of a new dish-depressed center wheel. (American Emery Wheel Works)

For free copy circle No. 28 on postcard

Radial Drill

A highly versatile production machine with a simple approach to automation is featured in an informative bulletin. Special features and specifications are presented along with equipment illustrations. (Burg Tool Mfg. Co., Inc.)

For free copy circle No. 29 on postcard

End Mill Driver

A recent innovation in end mill cutting offers a whole new concept in milling operations and eliminates many of the disadvantages of conventional type milling. Orbital mo-

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THE IRON AGE
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FREE LITERATURE

tion, set by micrometer adjustment, saves time. Bulletin describes 4-to-1 increased ratio between the spindle and the cutter speed. (Portland Double-Quick, Inc.)

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Hydraulic Shears

Descriptions and illustrations of features of design and construction are included in a bulletin on hydraulic shears. The shears range in capacity from 8 ft of ⅜ in. mild steel to 12 ft of 1½ in. mild steel. (Verson Allsteel Press Co.)

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Motion-Control Sheave

Variable speed sheaves with resilient cam-follower design eliminate freezing and sticking. These sheaves, featured in a descriptive bulletin, hold a constant driven speed under varying torque conditions. Tables facilitate the selection of companion sheaves and belts to meet specified drive requirements. (T. B. Wood's Sons Co.)

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Pneumatic Conveying

Vacuum equipment, described in a four-page folder, reclaims, processes and conveys scores of materials. Typical applications include pneumatic conveying of plastic pellets, cleaning boiler tubes and removing used coolant from machine sumps. (Invincible Vacuum Cleaner Mfg. Co.)

For free copy circle No. 33 on postcard

Air-Power Staplers

Important design features that assure improved stapling quality and speed are pointed out in brochure form. Design features include: air return, high speed piston and instant valve action. (Plaslode Co.)

For free copy circle No. 34 on postcard

Plug-In Limit Switches

Limit switches that can be replaced or moved to different locations in seconds, with no electrical work required in the change, are featured in catalog. This series offers the smallest fully adjustable sealed limit switches available. (Micro Switch Div., Minneapolis-Honeywell Regulator Co.)

For free copy circle No. 35 on postcard

Process Stainless

A 12-page booklet describes processing lines for handling stainless steel in mills and steel service centers. It includes illustrations and information on annealing and pickling lines, slitting lines, cut-to-length lines, grinding and scouring lines, and vacuum handling equipment for austenitic sheet and strip. (Production Machinery Corp.)

For free copy circle No. 36 on postcard

Water Softeners

Automatic vs. manual controls and calculations of softening capacity are discussed in a publication. The more frequently used siliceous and non-siliceous zeolite materials are also described. Illustrations and cut-away drawings show typical treatment systems. (Cochrane Corp.)

For free copy circle No. 37 on postcard

Remodel with Aluminum

The many uses of maintenance-free, permanent aluminum products are emphasized in a 36-page booklet on home improvement. From the basement up, versatile aluminum offers economy of installation and maintenance. (Aluminium Ltd.)

For free copy circle No. 38 on postcard

Conveyor Elevators

Two different conveyor systems of concave flights and interlocking flanges are illustrated in a brochure. Both are used for vertical elevation of wet or dry flowable bulk materials. Also included in the brochure are dimensional engineering drawings of installations with various receiving hopper arrangements. (Hapman Corp.)

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Strong Restraining Influences... Roebling Hose Reinforcing Wire

Roebling Hose Wire, Hose Reinforcing Wire and Hose Wrapping Wire bear the stamp of Roebling's strict attention to constant uniformity. As with all Roebling wire products, each is wholly Roebling-made and Roebling-controlled, from open hearth to packaging. Tensile strength and forming qualities, finish and gage are of an excellence that proves itself in use.

Resistance to internal and external pressures and wear are what you look for in hose wires and what you pay for. With Roebling, you *get* them.

For further information on these and other Roebling quality products, write or call Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey.

Roebling... Your Product is better for it

ROEBLING

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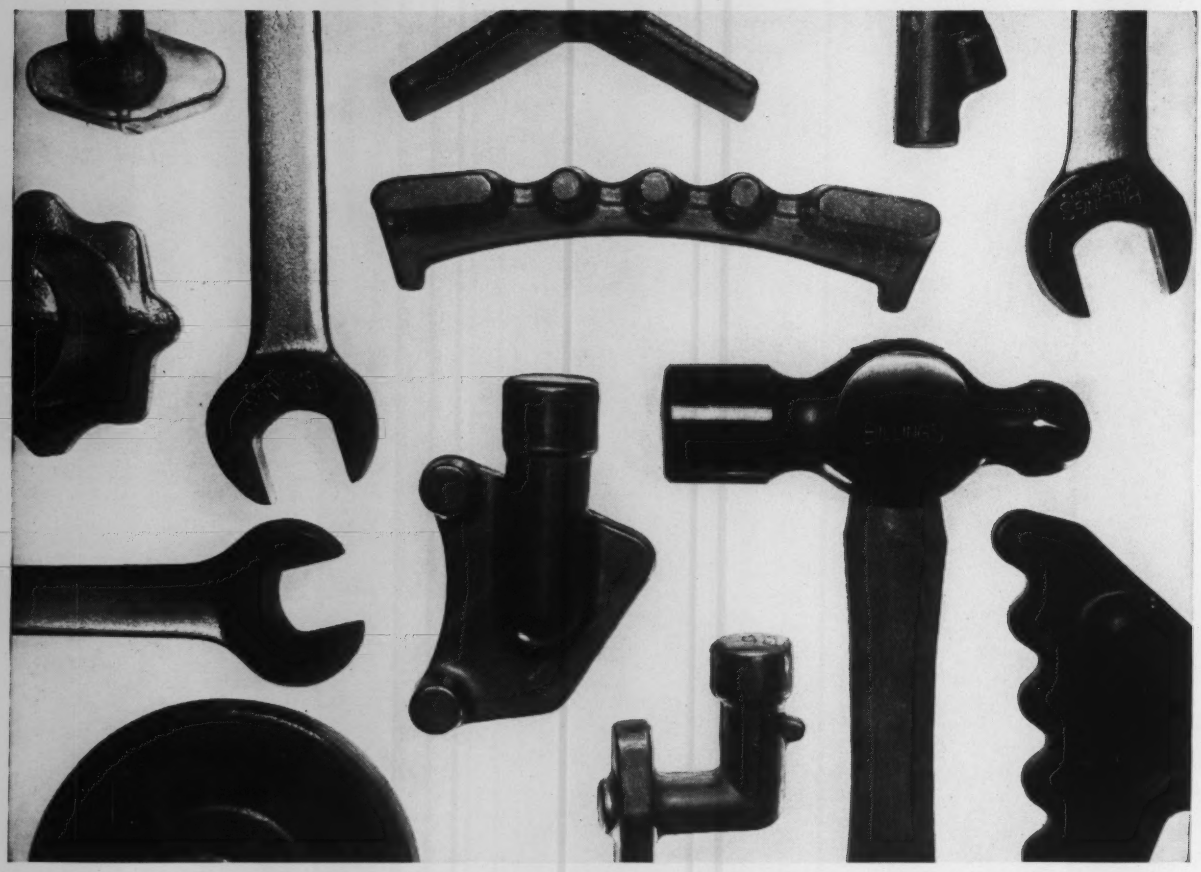
The Colorado Fuel and Iron Corporation



The Billings & Spencer Co. produces hundreds of quality forgings daily—from aircraft and missile parts to hand tools. Speedomax H temperature control helps hold rejects to a minimum.

Control of forge fires improves profitability...

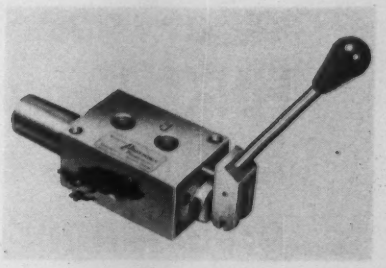
... at The Billings and Spencer Co., Hartford, Conn., where Speedomax® H controllers are providing the right temperatures for a variety of forgings, ranging from mechanics' hand tools of carbon and low alloy steels, to aircraft and missile parts made of today's modern high temperature alloys. The combination of precise temperature control, good furnace design and good forge-shop practices has not only reduced rejects ... it has saved fuel and greatly improved furnace life. Rugged, compact and completely reliable, Speedomax H is providing similar benefits for numerous other heat treat operations ... is helping both to modernize production, and to produce a quality product. *Whatever your heat treat, it'll pay you to investigate Speedomax H!* For details, contact your nearest L&N office, or write 4956 Stenton Avenue, Philadelphia 44, Pennsylvania.

Unaffected by either high ambients or continuous vibration, Speedomax H provides dependable, uninterrupted regulation of forge temperatures.

LEEDS Instruments NORTHRUP Automatic Controls • Furnaces

New Materials and Components

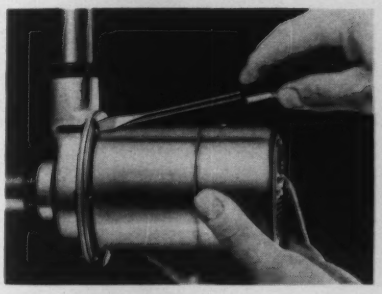
Tiny Directional Valve Gives Four-Way Control



Designed for small hydraulic circuits, under 3 gpm, this valve is 2 x 1½ x 5 in. (plus handle) and weighs 1 lb, 2 oz. It has a pressure drop of about 13 psi at the rated capacity. Internal leakage is less than 10 cu in. per minute at 2000 psi with 150 ssu oil. It's available with standard ⅛ and ¼ in. dry seal pipe threads. Porting and manifold mounting are made to order. The balanced spool, made of hard-coated aluminum, provides great wear life. (Sarasota Precision Products, Inc.)

For more data circle No. 45 on postcard, p. 85

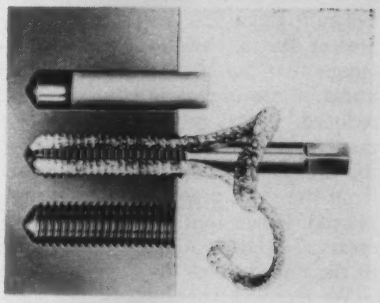
"Canned" Pump Needs No Lubricant or Coolant



Weighing less than 7 lb, this unit delivers over 800 gph. and produces heads up to 12 ft. The leakproof unit is constructed from corrosion resistant materials. Rotor, shaft and impeller form a single assembly. This assembly is enclosed, or "canned" in a stainless steel cylinder. No external lubrication is required; the pumped fluid acts as a lubricant and coolant. Pressures to 150 psi and temperatures to 220°F are handled. Automatic overload cutout protection is provided. (Dynapump Div., Fostoria Corp.)

For more data circle No. 46 on postcard, p. 85

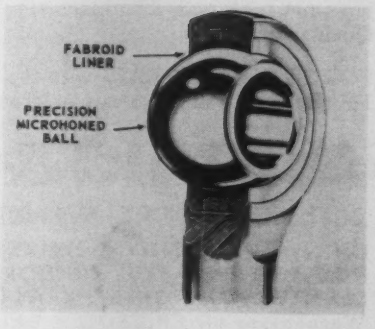
Tap Blind Holes by Using Wax Cartridges



Wax pellet cartridges eliminate chip problems encountered in blind hole tapping operations. After drilling, a wax pellet is dropped into the blind hole. As the tap works its way into the hole, a solid flow of wax carries the chips along and out the flutes—as fast as the chips are formed. The last chips, left at the bottom of the hole, embed themselves in the wax portion still in the tap flutes. These chips are withdrawn with the tap. Elimination of chip interference allows the tap to touch bottom. Chip removal operations are also eliminated. (The Tap Cartridge Co.)

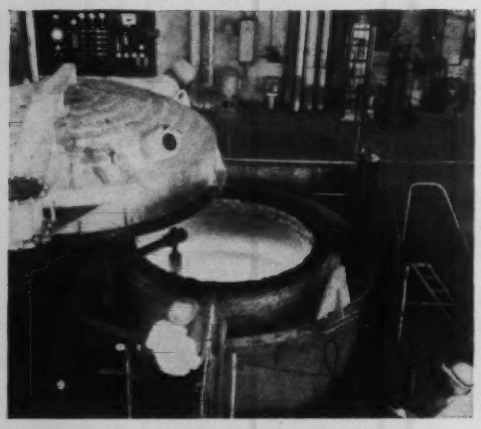
For more data circle No. 47 on postcard, p. 85

Self-Lubricating Bearings Carry Wide Impacts



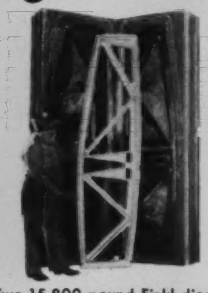
Incorporating a woven fabric with both glass and Teflon fibers, and backed up by a second fabric of glass cloth impregnated with phenol, self - lubricating bearings provide high load carrying capacities. The phenol acts as a bonding agent and prevents Teflon movement when load is applied. Coefficient of friction between the fibers and the polished steel shell ranges between 0.01 -0.06, with an average of 0.025. This compares favorably with lubricated metal bearings which have about 0.25 average. 50,000 psi is capacity. (Micro-Precision Div., Micromatic Hone Corp.)

For more data circle No. 48 on postcard, p. 85

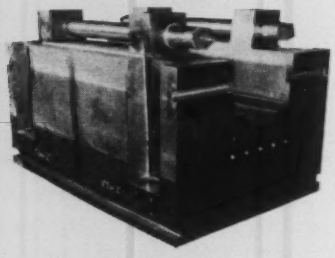


HOT WORK STEELS · ELECTRIC FURNACE STEELS · DIE BLOCKS · FORGINGS

FINKL *Vacuum Degassed* DIE BLOCKS and FORGINGS *give longer service life!*



Two 15,800 pound Finkl dies for precision aircraft forgings



36,000 pound die holder for use in titanium production, completely machined by Finkl

DIE BLOCKS made with Finkl vacuum degassed EF steels have greater ductility and toughness. This means that the chances of breakage under severe operating conditions is reduced. More production time is made available. With about 50% of the non-metallic inclusions removed from the steel, machineability is improved. Fewer tool regrinds are necessary. Higher lusters are obtainable in the impressions.

We supply 5 types of pre-hardened, ready-to-use die blocks, inserts and hot work tools in Special Machining Quality steel.

FORGINGS by Finkl are famous for their strength and resistance to withstand the severe stresses and strains imposed by modern heavy-duty machinery. Now available on request are Finkl vacuum degassed EF alloy steel forgings. The degassed steel adds even greater toughness and ductility to the forging, and the cleaner steel substantially increases tool life.

We also furnish forged parts of carbon steels in smooth forged, rough- or finished–machined condition.

FORGE REPAIR PARTS with the advantages of Finkl vacuum degassed EF alloy steels are also available on request.

A. Finkl & Sons Co.

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Warehouses in: CHICAGO • DETROIT • BOSTON • LOS ANGELES

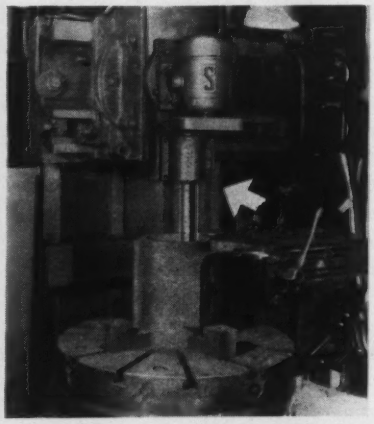
One-Piece Anchor Bolt

A one-piece, single integral expansion bolt simplifies the fastening or anchoring of structural members, machinery or electrical equipment in concrete, masonry, stone, plastic, steel and other non-frangible materials. The new expansion bolt eliminates the need for marking operations, and requires only one-size hole. It expands as it is wrench-tightened to provide a perfect, lasting anchor. Holding power up to four times greater than conventional fasteners is reported. (Kirel Inc.)

For more data circle No. 49 on postcard, p. 85

Grinding Attachment

Where micro-finishes are sometimes needed, but limited grinding requirements do not justify purchase of a large vertical chucking grinder, a grinding attachment is useful for conversion of existing boring mills or vertical turret lathes. Only one setup is involved. After metal turning, identical register in grinding is accomplished by allowing the work to remain in place and completing the grinding by removing the turning tool and installing the grinding

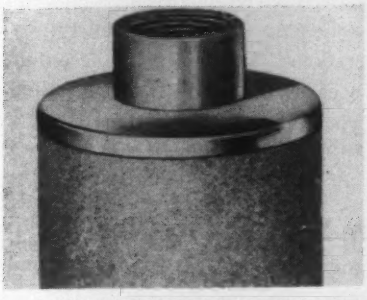


attachment. Nine different designs are available. (The Standard Electrical Tool Co.)

For more data circle No. 50 on postcard, p. 85

Hydraulic Filters

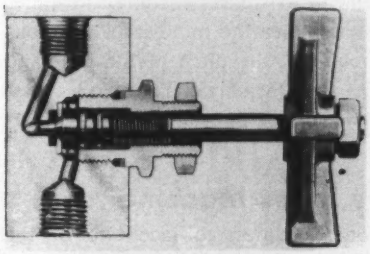
Designed for extra large surface areas and for added depth of filtration, a sintered metal hydraulic suction filter provides complete protection for hydraulic machinery and oil recirculating equipment. The filter reduces downtime, maintenance and expensive repairs by filtering dirt, grit, pipe scale and other impurities. This prevents scored cylinders, valve leaks and pump failures. (Arrow Tools, Inc.)



For more data circle No. 51 on postcard, p. 85

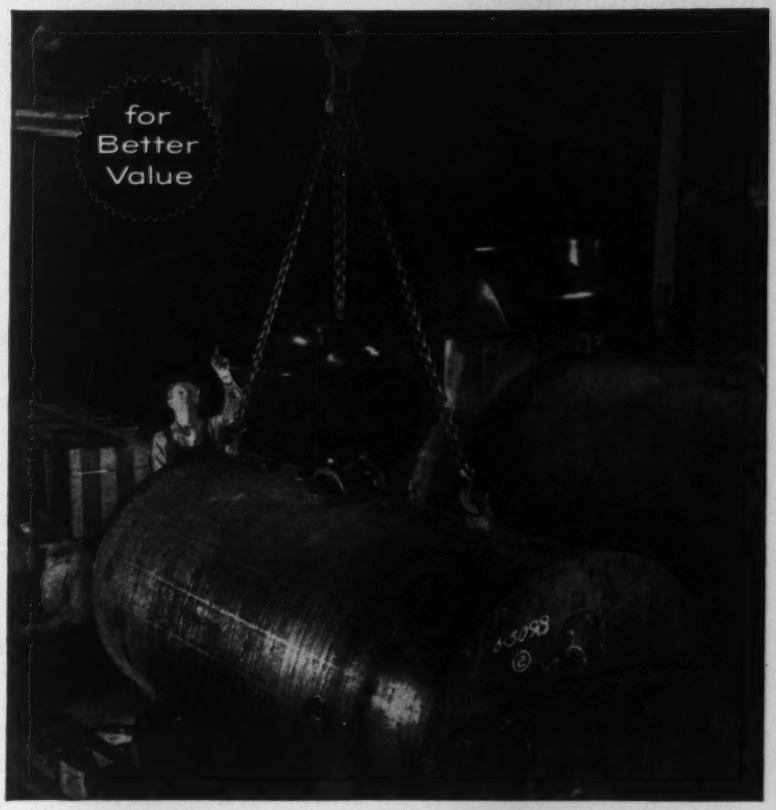
Soft-Seat Needle Valve

A soft-seat needle valve for either gases or liquids gives bubble-tight service up to 6000 psi. Operating temperatures range from —65° to 160°F. All internal parts may be removed and serviced without removing the valve from the line.



The nylon sealing seat is protected from abrasion by a metal retainer. All metal parts are stainless steel, except the handle, which is aluminum alloy. The stem has a 40-pitch thread for fine adjustment and ease of turning under high pressures. (Republic Mfg. Co.)

For more data circle No. 52 on postcard, p. 85



Amazing one-day service with new Accoloy Kuplex Slings

• The man to see for really speedy service on your sling chain orders is your nearby Authorized KUPLEX distributor. Within 24 hours, he can supply you with ACCOLOY KUPLEX Sling Chains assembled locally from matched components which have been designed and manufactured for use with all other KUPLEX parts. Matched KUPLEX components are made to ACCO *Registered* specifications from heat-treated ACCOLOY steel, and are factory proof-tested at twice working load limits to assure their being as strong as the chain itself. These facts are attested to in a Certificate of Test issued by ACCO and signed by the distributor who assembles and sells you complete KUPLEX sling chain assemblies.

If it's factory-built slings you desire, he can also supply you with ACCO *Registered* Sling Chains.

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Write our York, Pa., office for the name of the Authorized KUPLEX Sling Chain Distributor nearest to you.

Accoloy Shaped Master Link
Drop Forged Accoloy KUPLEX Hook (magnaflux tested)
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Accoloy 125 Chain

6 CHAIN SIZES with these **4** COMPONENTS

• A nearby Authorized ACCOLOY KUPLEX Sling Distributor can furnish promptly from his stock the exact sling chains for your specific requirements; made up from above components. Six chain sizes (¼" through ⅞") are available in single, 2-leg, 3-leg or 4-leg styles.

Accoloy Kuplex Sling Chains

ACCO

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Bridgeport, Conn. • Factories: *York and *Braddock, Pa.

Sales Offices: *Atlanta, Boston, *Chicago, *Denver, Detroit, *Houston *Los Angeles, New York, Philadelphia, Pittsburgh, *Portland, Ore., *San Francisco

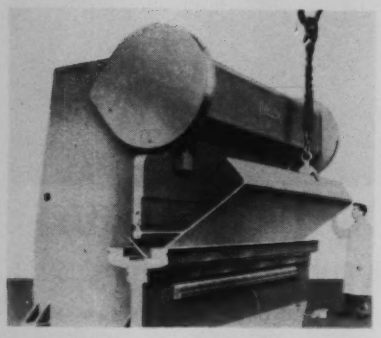
*Indicates Warehouse Stocks

New Equipment and Machinery

Cut Cost of Grinding Multiple Diameter Shafts

An exclusive development cuts set-up and operating time for precision grinding of shafts with two or more different diameters. Small to medium size lots of multiple diameter shafts for varied applications are ideal for this machine. Concentricity between diameters is improved over methods where the work pieces are racked between operations. The diameter to be ground is easily dialed by turning a handwheel. (Landis Tool Co.)

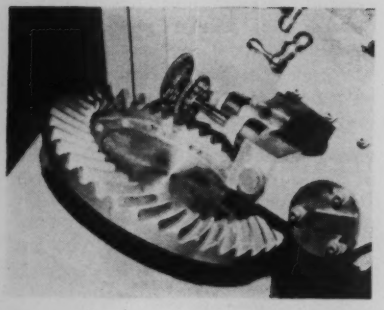
For more data circle No. 53 on postcard, p. 85



Press Brake Gives Maximum Support to Dies

Expansion of tonnage capacities (now 90-1500) is a feature of new press brakes. Overall bed and ram lengths range from 6 to 24 ft, while bending capacities are for 12 gage to 1-in. mild steel. Principle design changes are: Choice of power or manual clutch, brake and treadle; two-speed transmission; rocker type end guide bearings for precise, endwise alignment, even when the ram is tilted for taper work; wide choice of special features and arrangements. A box crown encloses connections and places them close together for a stiffer ram. (Niagara Machine & Tool Works)

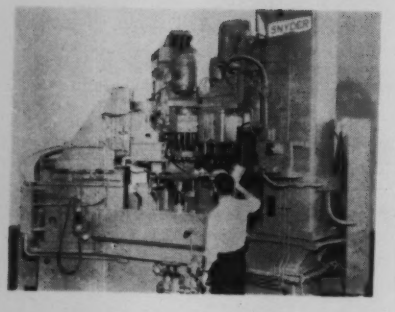
For more data circle No. 54 on postcard, p. 85



Grinder Simultaneously Deburrs and Chamfers

Designed to deburr and chamfer the entire contour of both ends of the teeth on spur, helical or bevel (heel and toe) gears, a twin-spindle automatic high speed grinder drives reinforced wheels at 17,000 rpm with standard air spindles. Spindles rotate in directions to prevent wheels from digging in. The standard machine handles gears from 3 to 13 in. OD; other models are available for gears to 20 in. OD. Grinding wheels are protected by the head during loading. A timer determines the number of rotations required, the pitch of the gear and its size. (Michigan Tool Co.)

For more data circle No. 55 on postcard, p. 85



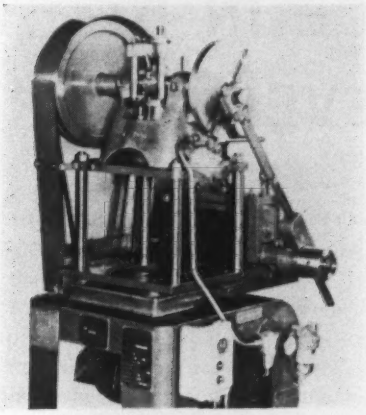
Special Five-Station Rotary Index Machine

A new special rotary index machine mills, drills, countersinks and taps compact car differential carriers at a rate of 97 parts per hr at 100 pct efficiency. Four recessed holes in the carrier are spot-faced by a unique milling operation. A two-spindle milling head is first fed to depth, traversed sideways in one direction to face two of the hole surfaces, and then fed in the opposite direction and back to center position to face the other two surfaces. The control panel is mounted on the side of the machine. Hydraulic parts clamping is provided. (Snyder Corp.)

For more data circle No. 56 on postcard, p. 85

Die-Trimming Presses

Increased die space on a new series of presses makes it possible to use lower-tonnage presses than are usually required simply to obtain necessary die space for die-



trimming operations. They come in 8-, 12-, and 16-ton sizes, with 12 x 12-, 12 x 14-, and 12 x 14-in. beds, respectively. (Sales Service Mfg. Co.)

For more data circle No. 57 on postcard, p. 85

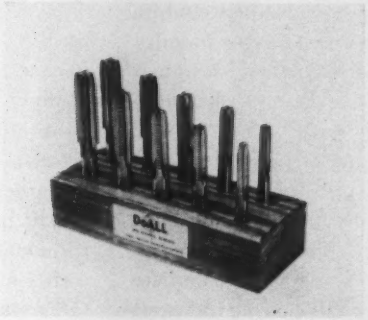
Following Welder

A mechanical - follower tracer welding system permits automated welding operations on untrimmed, out-of-tolerance, straight-line, or contour edges. It does this in a continuous automated welding operation. The system was developed for welding automotive-frame siderails and crossmembers, which exhibit many out-of-tolerance conditions. In this work, a totally cam-controlled automated welding machine cannot be used. This system compensates for deviations, and accurately follows and correctly positions the welding torch on the weld line. A probe follows the actual weld contour line, and another unit correctly positions the welding torch on the actual weld line. (Expert Welding Machine Co.)

For more data circle No. 58 on postcard, p. 85

Left-Hand Tap Sets

Now available as a stock item is a set of left-hand taps. Having such a set on hand will protect users against delays on emergency or crit-

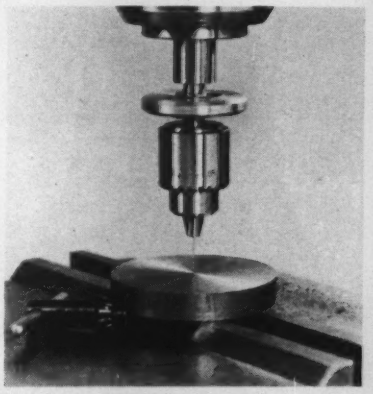


ical jobs. It contains 10 taps, HSS, ground thread, ¼ through ½ in., UNC and UNF. (The Do-ALL Co.)

For more data circle No. 59 on postcard, p. 85

Fine-Hole Driller

For mill or drill press, an ultra-fine-hole driller has an accuracy of 2-tenths. This adapter enables drilling of pilot holes or production drilling of tiny holes, even with large equipment. "Fingertip con-



trol" by means of a ball-bearing feed ring enables feeding the drill into the work as slowly and carefully as desired. The adapter comes with a Jacobs #0 key chuck or the Albrecht #15-JO. The shank is ½-in. diam, 2 in. long, and fits stand-

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45 Tons	24 GSG	48 x 96
76 Tons	24 GSG	48 x 120
93 Tons	26 GSG	36 x 120
3 Tons	28 GSG	36 x 96
117 Tons	28 GSG	36 x 120

NEW ORLEANS

10 Tons	24 GSG	36 x 96
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100 Tons	1/4" x 84" x 240"
100 Tons	1/4" x 84" x 360"
81 Tons	5/16" x 84" x 360"
54 Tons	1/2" x 84" x 360"
81 Tons	3/4" x 96" x 360"
110 Tons	1" x 96" x 360"

Also in stock above thicknesses in widths 5' and 6'

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150 NT—	1/4" x 84" x 240"
100 NT—	1/4" x 96" x 240"
100 NT—	5/16" x 72" x 240"
100 NT—	3/8" x 72" x 240"
50 NT—	3/8" x 84" x 240"
75 NT—	1/2" x 72" x 240"
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HOW REPUBLIC PIG IRON SERVICE IN DEPTH HELPS FOUNDRYMEN EVERYWHERE

Pig iron *service in depth* is an exclusive Republic concept. It is designed to help you solve foundry production and metallurgical problems—designed to help you produce better castings most efficiently, economically, and profitably.

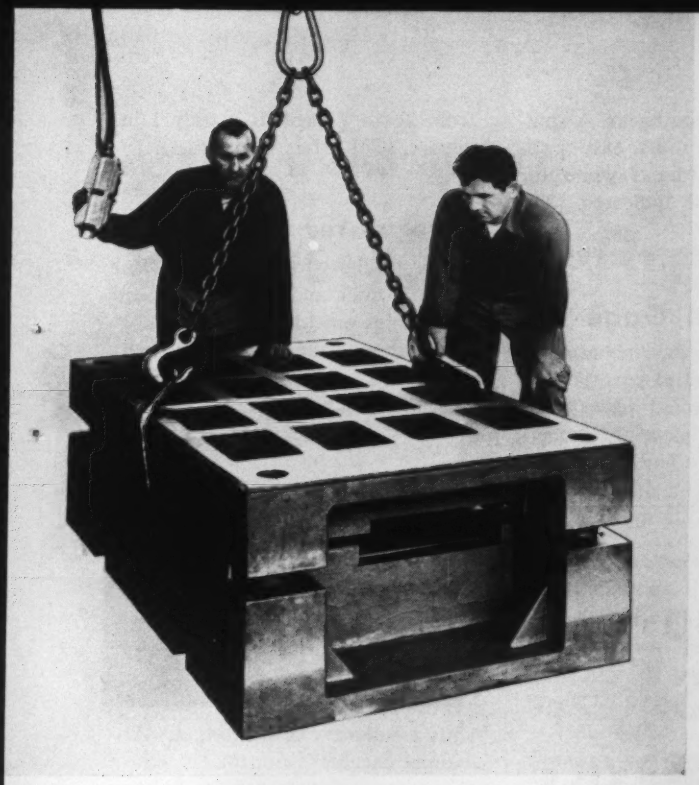
Here is how *service in depth* helps foundrymen everywhere.

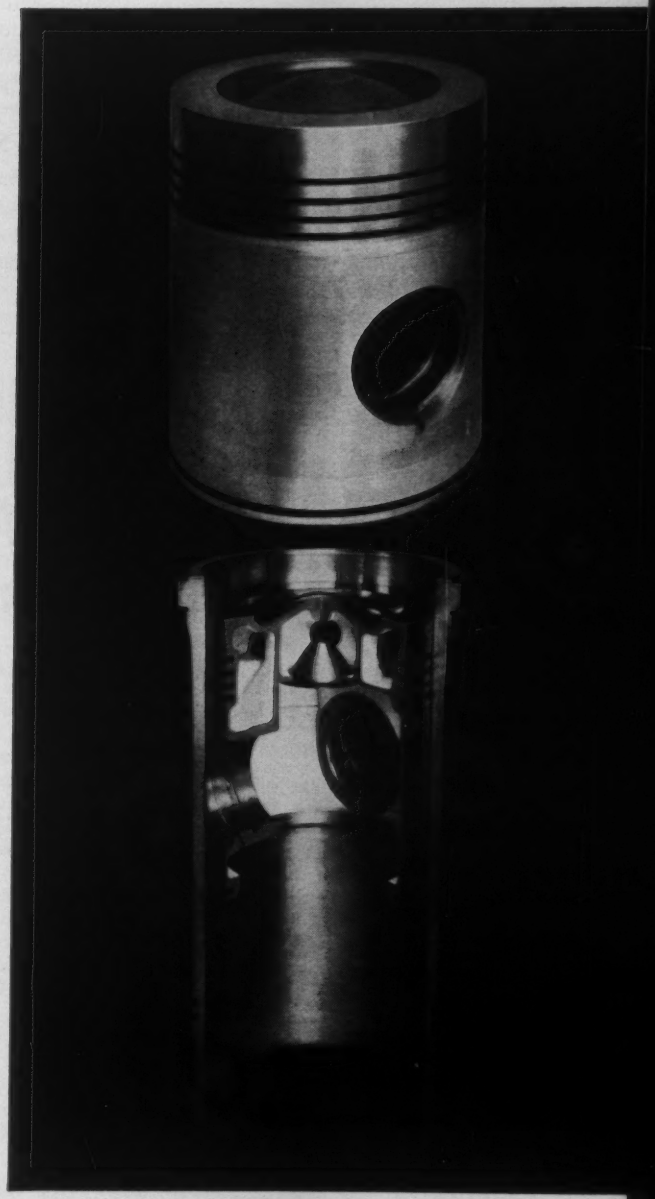
First, Republic is the only producer of both Northern and Southern Irons. This means you can select the proper grade from the most complete line of merchant pig iron available in the industry. Northern grades include Chateaugay, Malleable, Bessemer, Foundry, and Basic. Southern furnaces produce Foundry and Basic.

Then, Republic provides expert metallurgical service to assist you in selection, application, and processing. Republic Pig Iron Metallurgists are frequent and welcome visitors in hundreds of foundries. They have at their fingertips information on the latest processes and techniques available for improving castings, and for expanding their use and sale. Their suggestions often result in improved operations, increased production efficiency, and in recapturing business lost to other methods of fabrication.

Service in depth is available now. Clip and mail the coupon for obligation-free metallurgical service, or for more information on Republic Pig Irons.

Here are three examples of pig iron *service in depth.*





1. UNIFORM CHEMISTRY HELPS PRODUCE HIGHEST QUALITY DIE SETS. The Producto Machine Company, Bridgeport, Connecticut, casts die set parts using only raw materials with a definite known analysis, including Republic Pig Irons. The year-in, year-out uniform chemistry of these fine irons helps Producto produce high quality, laboratory-controlled castings. The company has found that there is no better, no more economical means for insuring strong, flaw-free, easy-to-machine castings.

2. CHATEAUGAY AGAIN PROVED IDEAL BASE METAL FOR DUCTILE IRON. Problem: Design a diesel engine piston with high mechanical strength, minimum weight, maximum wear- and heat-resistance, low ultimate cost. Using Chateaugay Pig Iron as the base metal, Hunt-Spiller Manufacturing Corporation, Boston, Massachusetts, successfully met all of these requirements in developing ductile iron diesel pistons as a replacement for aluminum. High total carbon and unusually low phosphorus, silicon, and manganese suit Chateaugay perfectly to ductile iron use. Inherently excellent physical properties are maintained in the ductile form assuring strong, flaw-free casting accurate to patterns and shapes.

3. METALLURGICAL SERVICE BENEFITS FOUNDRY'S CUSTOMER. On the advice of a Republic Pig Iron Metallurgist, Atlantic Foundry Company, Akron, Ohio, switched to Chateaugay Pig Iron for ram and cylinder castings used in hydraulic presses. The result: stronger castings, better machinability, higher wear-resistance, and a 21% saving to the customer. The value of Republic metallurgical service is pointed out in this statement by Atlantic's Vice President of Iron Foundry Operations. "When we have a foundry problem and put in a call for help, your metallurgical engineers are Johnny-on-the-spot, talking a language we can understand. Then it's not long before the problem is solved."

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ard ½-in. drill chucks or a Gallatin chuck. Drill capacity runs from 0.005 to 5/32 in. (Hunter Tools).
For more data circle No. 60 on postcard, p. 85

Magnetic-Base Holder

A new model magnetic-base indicator holder holds all types of indicators, including rack-and-pinion models with lug-type backs. A shut-off pushbutton permits easy positioning with one hand while the other positions the indicator. (The L. S. Starrett Co.)
For more data circle No. 61 on postcard, p. 85

Handy Steel Gage

In keyring form, including a chain, a small stainless-steel gage contains slots around its edge to measure the 12 most used gages from 26 to 7 gage. It is only 1 in. square. (Columbus Hydraulics)
For more data circle No. 62 on postcard, p. 85

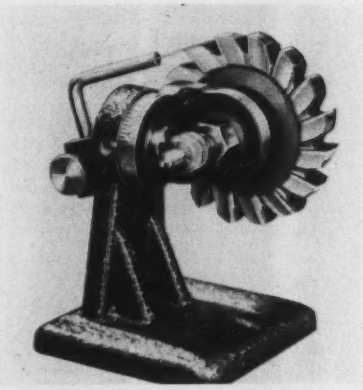
Overwater Crane

A special rotating overwater crane is dock-anchored at one end and swings out to unload barges. A novel remote operator's cab permits a full view of the action. Providing excellent control, it has a high unloading speed. (Whiting Corp.)

For more data circle No. 63 on postcard, p. 85

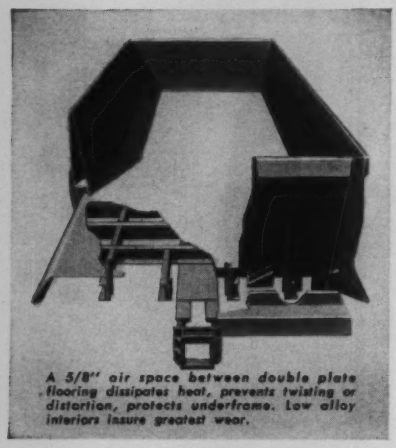
Cutter-Grind Fixture

A simple fixture enables grinding and sharpening of plain milling cutters up to 6-in. diam, with bores of ⅞, 1, and 1¼ in., on a horizontal surface grinder. In many shops it will eliminate the need for a universal tool and cutter grinding machine. The bracket holding the arbor on which cutters are held is tiltable, and has a graduated dial, to enable grinding exact angles on teeth. A simple ratchet arrangement passes cutter teeth for grinding one at a time. (Montgomery & Co., Inc.)



For more data circle No. 64 on postcard, p. 85

MAGOR AIR DUMP CARS
FOR STEEL PLANT SERVICE

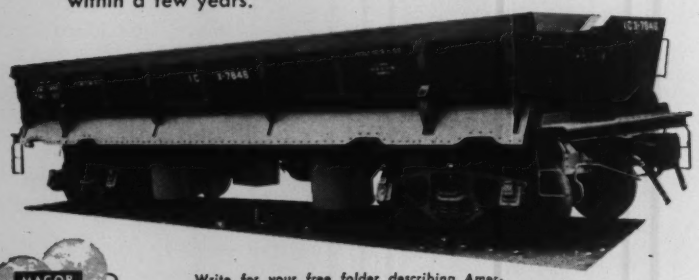


A 5/8" air space between double plate flooring dissipates heat, prevents twisting or distortion, protects underframe. Low alloy interiors insure greatest wear.

The new Magor Air Dump Car for steel plant service can cut your refuse disposal costs as much as 40%! Safe, swift, automatic dumping eliminates expensive labor and crane equipment. Low height and open type body means faster loading. Saves time, labor and haulage costs! Smooth interiors eliminate "dead load" returns!

The double-plate flooring shown here is just one of the many Magor design features that account for Magor's leadership in dump car production. Designed for the job—built to last, Magor Air Dump Cars cost less to buy—less to operate!

Savings effected by the new Magor Air Dump Cars will write off your entire dump car investment within a few years.



MAGOR

Write for your free folder describing America's number 1 air dump car, today!

MAGOR CAR CORPORATION
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The Iron Age Summary

Prices Keep Pressure on Market

If increases in the price of steel are delayed, demand will stay high even after inventories are back to normal.

Users will continue to build stocks as a hedge against higher costs—until the first price hike.

■ The prospect of higher prices will put added pressure on the steel market.

With uncertainty surrounding prices, steel users will not relax their efforts to build stocks as a hedge against higher costs. This will hold true even after the market eases or after inventory levels appear adequate.

First Half Record — Continued demand for steel will be enough to ensure production of 70 million ingot tons in the first six months of 1960. This will break the previous record of 64.3 million tons set in the hectic first half of 1959 when mills were pushing to fill pipelines prior to contract expirations.

And it will put the industry well on the way to the 130 million tons predicted for the entire year. Even a collapse in the market later in the year would not stop the industry from breaking the record 117 million tons produced in 1955.

Timing Uncertain—Pressure for steel will last until the first price increase. Because the first actual wage increase will not go into effect until Dec. 1, there is a lot of talk about no price increase before then.

This isn't necessarily the case. Steel companies face immediate cost increases due to immediate boosts in fringe benefits.

However, price hikes in steel will not necessarily be applied "across the board" when they do come. It is possible some companies will raise prices several months before others do. A dual price system has existed in the past when the market has been tight. And the present market is strong enough to support such prices.

View from Detroit — First price increases will undoubtedly come in products in shortest supply to meet demand — sheet and strip. These types of steel are used extensively for consumer durable goods such as automobiles and appliances.

One automaker has already gone on record that it will increase its prices if the price of steel goes up. Others would probably follow such a lead.

Contract Headaches—Settlement with the major steel producers hasn't solved all of the labor problems of all of the steel producers. A significant number operated during the strike under contract extensions.

Extension agreements contained provisions for applying economic benefits of the new contract retroactively. However, the new contract doesn't provide for an immediate wage increase. Instead, the companies have taken over payment of life, accident and health insurance programs.

As an equivalent to these payments the union is asking, generally, lump sum payment of 8¢ for each hour worked under extensions.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week 2,707	Last Week 2,707	Month Ago 2,731	Year Ago 2,123
Ingot Index (1947-1949=100)	168.5	168.5	170.1	132.2
Operating Rates				
Chicago	95.0	95.0	96.0	83.0
Pittsburgh	96.0	96.5*	97.0	72.0
Philadelphia	102.0	102.0*	102.0	77.0
Valley	92.0	96.0*	93.0	59.0
West	90.0	87.0*	94.5	85.0
Cleveland	97.0	97.0*	99.5	83.0
Buffalo	105.0	105.0	107.0	63.5
Detroit	101.0	103.0*	98.0	95.5
South	93.5	93.0	86.5	90.5
South Ohio River	98.0	99.5*	100.5	85.0
Upper Ohio River	95.5	90.5*	93.0	86.5
St. Louis	94.0	87.0*	99.0	87.5
Aggregate	95.0	95.0	96.5	75.0

*Revised

Prices At a Glance

(Cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.41	$66.41	$66.41	$66.41
Scrap No. 1 hvy (Gross ton)	$41.50	$41.50	$47.17	$40.50
No. 2 bundles	$28.17	$27.83	$27.50	$29.00
Nonferrous				
Aluminum ingot	28.10	28.10	26.80	26.80
Copper, electrolytic	33.00	33.00	33.00	29.00
Lead, St. Louis	11.80	11.80	12.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	99.50	99.375	99.00	99.125
Zinc, E. St. Louis	13.00	12.50	12.50	11.50

Furnace Price Increases Likely

Until now, industrial furnace makers hoped to hold their present price line.

But chances of a steel price increase make furnace price increases probable.

▪ Early last month industrial furnace builders hoped to hold the price line during 1960.

The steel strike settlement—with its prospect of higher steel prices—dashed some of these hopes. Most furnace makers surveyed by The IRON AGE expect an increase in prices sometime this year. Estimates on the increase range up to 5 pct.

Deliveries Lengthen—Since the middle of last year, furnace deliveries have been extending gradually. At the same time manufacturers' backlogs have increased. Most furnace makers questioned say backlogs are greater than this time a year ago.

Based on answers to the survey, here are some delivery estimates: Standard or catalog equipment—4 to 12 weeks, induction melting equipment—8 to 10 weeks, induction billet heater—10 to 12 weeks, special heat treating furnaces—16 to 30 weeks, roller hearth furnaces —16 weeks, atmosphere generating equipment—16 to 20 weeks, and specially engineered furnaces featuring automation—5 to 8 months.

Sales Are Up—As a group, the furnace makers are confident about the sales outlook for 1960. Typical is the comment of one manufacturer: "The sales trend for our company is definitely up and we expect 1960 to be about 20 pct better than 1959."

A similar view is expressed by the Industrial Heating Equipment Assn. The group's executive vice president, Robert E. Fleming, told IRON AGE: "A survey of the industry's top management indicates the value of orders in 1960 will rise 11.6 pct above the 1959 level. If it does, the backlog of unfilled orders at the end of the year will be greater than at the end of 1959.

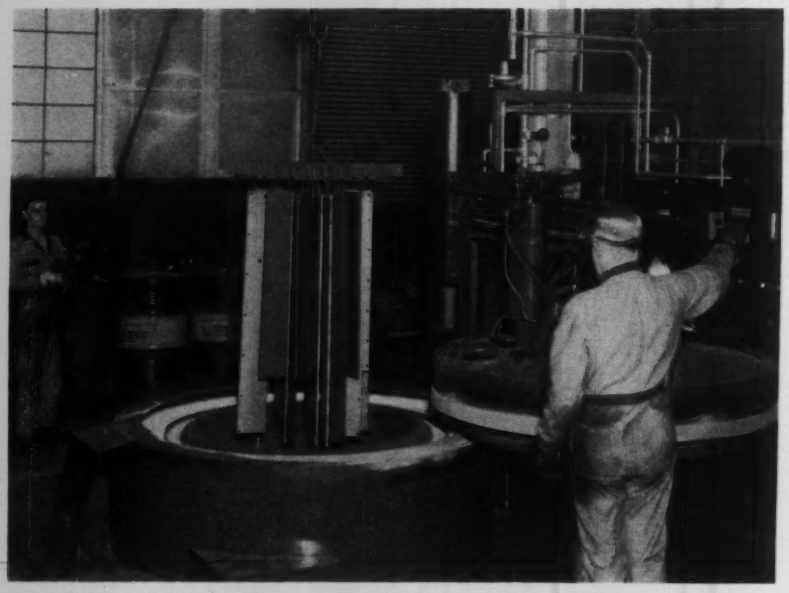
"This year American industry will place heavy emphasis on cost reduction and quality improvement. As a result, a great number of obsolete, unprofitable furnaces, ovens, and induction heating units will be replaced by modern, efficient, profit-making equipment. This, as we see it, is the only answer to increasing wage costs and fringe benefits.

"In 1960 the industrial furnace industry looks forward to one of its best years."

Trends to Watch—On the question of trends in heating equipment, furnace makers see these developments as important: High temperature furnaces, greater use of vacuum heating and induction furnaces and more automation.

Says one furnace builder: "The use of vacuum heating to replace conventional furnace atmospheres has an important place in the future. In the past furnaces operating in the temperature range of 2200° to 3000°F have been small laboratory type units. Now the development of high temperature materials makes possible the manufacture of relatively large production type units."

Another comments: "There is more and more demand for high temperature equipment to handle the new materials. Operating techniques are changing to the point where we no longer think of 3000°F as the maximum operating temperature of furnace equipment.



GOOD YEAR AHEAD: With backlogs extended and sales strong, industrial furnace makers look for a good year. (Leeds & Northrup Co. photo)

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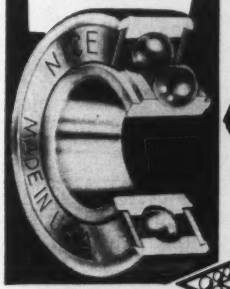

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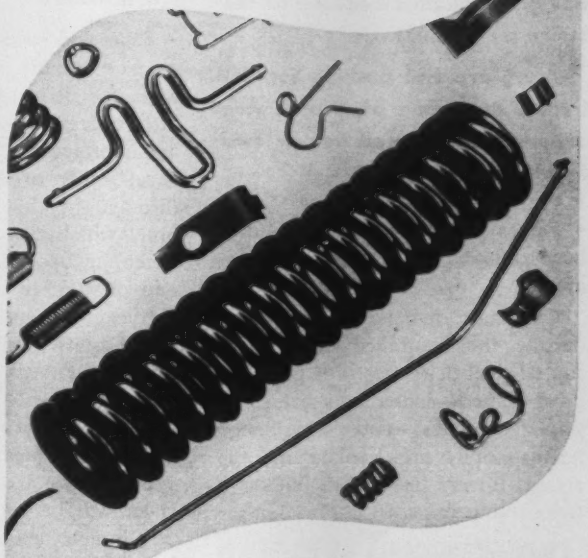

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Buyer Interest Stays At Strong Levels

Steel demand hasn't shown any great change because of the strike settlement.

Users are still pushing for delivery. But some pipe and wire orders are deferred one or two months.

▪ Buyer interest in steel has not been dulled by the contract settlement.

Customer demand stays strong, despite the assurance of uninterrupted steel deliveries. For products most wanted—including sheet, strip, tinplate, plates, and wide-flange beams—mills are booked months ahead. Buyers have been put on a strict quota basis.

Product Rundown — Users are showing no signs of cancelling or deferring sheet and strip orders. Much the same condition applies to bar. Among the heavy steel products, plates and wide-flange beams are strong and expected to stay that way. Demand for standard structurals is fair to good.

Right now, oil country goods are moving well. But mills say the oil country market lacks long-range strength.

Some Pushbacks — So far, the greatest signs of market easing showed up in construction products, especially wire and pipe. Fourth quarter demand for these items was strong. Before the strike settlement, buyers had been pushing for January deliveries.

Now some of these orders have been deferred to February or March. By that time the material will be needed to support spring construction demands.

Sheet and Strip—Automotive and other users are still pounding the mills for delivery. There is still a little interest in conversion tonnage and foreign supplies. **Pittsburgh** sheet mills expect full schedules through the first half. **East Coast** mills which were shut during the strike are booked well into the second quarter. In addition, there are carryovers from month to month. An **Eastern** mill which operated during the strike is sold out on February sheet and half booked for March.

In the **Chicago** market, cold-rolled, galvanized, and aluminized sheet will be critically short items all through the first half. Users there say mill carryovers and production delays are reducing deliveries.

Plate—Demand for heavy plate stays strong. One large **East Coast** producer is booked into May. Other mills there are full as far ahead as order books are opened. Most of the mills won't book orders beyond the normal 45-day lead time. Light plate producers express some concern about second quarter orders. It's felt some users may push back tonnages by then.

PURCHASING AGENT'S CHECKLIST

Machine tool sales should improve about 30 pct over 1959 levels. **P. 31**

Economy is heading into a new surge of inflation. **P. 45**

Is electron beam welding ready for the production line? **P. 66**

Shapes—Despite heavy demands for structurals from construction industry and freight car builders, the mills expect an easing of the market by late second quarter. By then increased mill facilities are expected to be producing in quantity.

Service centers are building up their stocks of structurals. But this is natural because of the normal seasonal lag in building. Most of the inventory buildup is in standards. There's less chance to accumulate stocks of wide-flange beams and light angle shapes.

Bar — Mill orders extend into March or April. Producers say all signs point to a strong first half. Since the strike was settled, users have entered few important cancellations. A few deferments are reported by the barmakers. Service centers in the **Midwest** are concerned about cold-finished bar deliveries. The situation has gotten worse in the last few weeks.

Pipe and Tubing—Mills are looking forward to first half operations at about 90 pct of capacity. Despite some deferments, demand for standard pipe is robust. Oil country producers are pushing for delivery, particularly of tubing. Linepipe prospects look good, but there's uncertainty about the timing of new pipe projects.

For all tubular products there are long-range problems. Domestic mills are being crowded out of foreign linepipe jobs by foreign pipe. Exports of oil country seamless have been hard hit by overseas competition. Buttweld faces a serious import threat.

Wire — Some buyers have deferred January delivery of wire products for construction uses. Deliveries have been set back closer to the seasonal spring upturn in construction projects.

Manufacturers' wire continues strong. Capacity bookings are assured for the first half, mills say. Carryovers on heavy rod coils are increasing at **Midwest** mills. But buyer demand for rod is not slackening off.

COMPARISON OF PRICES

(Effective Jan. 12, 1960)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Jan. 12 1960	Jan. 5 1959	Dec. 15 1959	Jan. 13 1959
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	13.55	13.55	13.55	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Jan. 12 1960	Jan. 5 1960	Dec. 15 1959	Jan. 13 1959
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.57
Foundry, Southern Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$43.50	$43.50	$41.50	$43.50
No. 1 steel, Phila. area	41.50	41.50	41.50	35.50
No. 1 steel, Chicago	39.50	39.50	40.50	42.50
No. 1 bundles, Detroit	39.50*	38.50	40.50	36.50
Low phos., Youngstown	48.50	48.50	49.00	46.00
No. 1 mach'y cast, Pittsburgh	55.50	55.50	55.50	50.50
No. 1 mach'y cast, Phila.	54.50	54.50	54.50	48.50
No. 1 mach'y cast, Chicago	60.50	60.50	60.50	54.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$41.50	$41.50	$47.17	$40.50
No. 2 bundles	28.17*	27.83	27.50	29.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	$14.75-15.50	$14.75-15.50	$14.50
Foundry coke, prompt	18.50	18.50	18.50	18-18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	33.00	33.00	33.00	29.00
Copper, Lake, Conn.	33.00	33.00	33.00	29.00
Tin, Straits, N. Y.	99.50†	99.375	99.00	99.125
Zinc, East St. Louis	13.00*	12.50	12.50	11.50
Lead, St. Louis	11.80	11.80	12.80	12.80
Aluminum, virgin ingot	28.10	28.10	26.80	26.80
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites
Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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District Engineers in Principal Cities

Scattered Buys Bring Selected Increases

Scattered mill purchases of limited tonnages of scrap brought higher prices in many districts.

But mills have yet to enter the market for what is generally called their "normal buy."

■ There were price changes in all sections of the country this week, but not in all districts. Nor were all grades of scrap affected.

In the East, there were selected price increases in Boston and New York, but limited new buys in Philadelphia confirmed quoted prices. Farther west, prices firmed in Pittsburgh. But a mill buy in Youngstown at higher prices brought a sympathetic price increase in an otherwise inactive Cleveland market.

In the Midwest, selected grades rose in Chicago and Detroit. A couple of grades went higher in price at St. Louis, but Cincinnati recorded no significant changes.

In the Southwest, a purchase by the Houston district mill brought the first price increase there for scrap for domestic use since last June. At the same time, a sharp drop was recorded in a few grades at Los Angeles while the rest of the Farwest market was unchanged.

Pittsburgh—The first mill purchases after the steel settlement brought only minor price adjustments. A local consumer bought No. 1 heavy melting at $43, No. 2 heavy melting at $37, and No. 2 bundles at $32. The price for No. 1 heavy melting was $1 more than the same mill had paid on its previous buy. In the same week, dealers were being quoted the equivalent of 50¢ more for a new order in the Valley.

Chicago—The market advanced raggedly on scattered sales of small tonnages. Lower offering prices had been bringing sinking tonnages for three weeks, and electric furnace and some foundry buyers began pushing prices up to encourage scrap flow. Mills continued to sit tight. Out-of-area mills continue to dip into the Chicago scrap supply.

Philadelphia — Lacking a push from local mills, the market is pretty much at a standstill. There has been some new buying by local mills, but the tonnages are small and prices are, for the most part, unchanged. As long as orders remain small, dealers seem willing to part with an occasional car of scrap. But they insist that higher prices will be necessary before a "normal buy" from one of the mills will bring out scrap. A fair demand for export also helps keep a floor under prices.

New York — A leading broker has raised buying prices for steelmaking grades by $2 per ton in this area. This brings No. 1 heavy melting steel to a top of $36. Some strength in turnings is also apparent.

Detroit—Mill inquiries are picking up, but still no big sales. Dealers say mill inventories are plentiful, as industrial scrap moves directly to mill from auto plants. Whether dealer prices soften again depends in part on how much scrap automakers turn out above their original estimates for January.

Cleveland — The market rose $1.50 a ton on price openhearth grades in the Valley on new orders, following in the wake of the steel labor settlement. Cleveland market moved up in sympathy, although locally it is sluggish. Some Pittsburgh scrap may move into the Valley. The Outlook is for a gradually strengthening market with a moderate price rise.

St. Louis—A very strong undertone prevails in this area. The feeling is that the market is building up momentum for an upward swing. Dealers aren't too anxious to sell because they feel that their scrap will be worth more tomorrow than it is today.

Cincinnati — The market is still slow. Dealers are reluctant to sell at present prices, but they're unable to get higher so they're selling small tonnages only. Pressure is mounting for a modest rise soon in sympathy with other areas.

Birmingham—There seems to be an underlying strength to the scrap market here. But a few small sales are being made at unchanged prices. Consumers indicate they do not plan to cut prices and may pay a little more when they do buy.

Buffalo — Prices are unchanged in an inactive market. Dealers are shipping on old orders and expect no new big sales this month.

Boston — Prices stiffened this week, moving up $1 to $2 on a number of grades. However, the firmness is more of an adjustment to other markets and doesn't really indicate activity.

West Coast—There was a mild break in the Los Angeles market as No. 2 heavy melting steel dropped $4 per ton and No. 1 dealer bundles fell $2 per ton. Prices in San Francisco remain unchanged.

Houston—The district mill entered the market with a small order for its January requirements. It pushed prices on heavy melting grades up $5 per ton over the previous domestic price which had not changed since last June.

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ACME STEEL **STEEL STRAPPING**

SCRAP PRICES *(Effective Jan. 12, 1960)*

Pittsburgh

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	45.00 to 46.00
No. 1 factory bundles	50.00 to 51.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	43.00 to 44.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	29.00 to 30.00
Low phos. punch'gs plate	52.00 to 53.00
Heavy turnings	37.00 to 38.00
No. 1 RR hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	60.00 to 61.00
Rails 2 ft and under	64.00 to 65.00
RR specialties	57.00 to 58.00
No. 1 machinery cast.	55.00 to 56.00
Cupola cast.	50.00 to 51.00
Heavy breakable cast.	48.00 to 49.00
Stainless	
18-8 bundles and solids	235.00 to 240.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	130.00 to 135.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	40.00 to 41.00
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	39.00 to 40.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	25.00 to 26.00
Low phos. forge crops	55.00 to 56.00
Low phos. punch'gs plate, ½ in. and heavier	52.00 to 53.00
Low phos. 2 ft and under	50.00 to 51.00
No. 1 RR hvy. melting	45.00 to 46.00
Scrap rails, random lgth.	57.00 to 58.00
Rerolling rails	64.00 to 65.00
Rails 2 ft and under	63.00 to 64.00
Angles and splice bars	55.00 to 56.00
RR steel car axles	60.00 to 61.00
RR couplers and knuckles	52.00 to 53.00
No. 1 machinery cast.	60.00 to 61.00
Cupola cast.	53.00 to 54.00
Cast iron wheels	48.00 to 49.00
Malleable	62.00 to 63.00
Stove plate	50.00 to 51.00
Steel car wheels	51.00 to 52.00
Stainless	
18-8 bundles and solids	220.00 to 225.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	120.00 to 125.00
430 turnings	60.00 to 65.00

Philadelphia Area

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	45.00 to 47.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	45.00 to 47.00
Machine shop turn.	22.00 to 23.00
Mixed bor. short turn.	23.00 to 24.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	26.00 to 27.00
Clean cast. chem. borings	27.00 to 28.00
Low phos. 5 ft and under	48.00 to 49.00
Low phos. 2 ft punch'gs	50.00 to 51.00
Elec. furnace bundles	48.00 to 49.00
Heavy turnings	34.00 to 35.00
RR specialties	50.00 to 51.00
Rails, 18 in. and under	67.00 to 68.00
Cupola cast.	42.00 to 43.00
Heavy breakable cast.	46.00 to 47.00
Cast iron car wheels	50.00 to 51.00
Malleable	67.00 to 68.00
No. 1 machinery cast.	54.00 to 55.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	20.00 to 21.00
Low phos. 18 in. and under	48.00 to 49.00
Rails, random length	54.00 to 55.00
Rails, 18 in. and under	62.00 to 63.00
No. 1 cupola cast.	49.00 to 50.00
Hvy. breakable cast.	44.00 to 45.00
Drop broken cast.	59.00 to 60.00

Youngstown

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	20.50 to 21.50
Shoveling turnings	25.50 to 26.50
Low phos. plate	48.00 to 49.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	$43.50 to $44.50
No. 2 hvy. melting	35.50 to 36.50
No. 1 dealer bundles	43.50 to 44.50
No. 1 factory bundles	45.50 to 46.50
No. 2 bundles	25.50 to 26.50
No. 1 busheling	43.50 to 44.50
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Cut structural & plates, 2 ft & under	48.50 to 49.50
Drop forge flashings	43.50 to 44.50
Low phos. punch'gs plate	44.50 to 45.50
Foundry steel, 2 ft & under	42.00 to 43.00
No. 1 RR hvy. melting	45.50 to 46.50
Rails 2 ft and under	65.00 to 66.00
Rails 18 in. and under	66.00 to 67.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	60.00 to 61.00
No. 1 machinery cast.	56.00 to 57.00
Stove plate	51.00 to 52.00
Malleable	67.00 to 68.00
Stainless	
18-8 bundles	215.00 to 225.00
18-8 turnings	100.00 to 110.00
430 bundles	115.00 to 120.00

Buffalo

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 busheling	36.00 to 37.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	20.00 to 21.00
Low phos. plate	44.00 to 45.00
Structurals and plate, 2 ft and under	44.00 to 45.00
Scrap rails, random lgth.	42.00 to 43.00
Rails 2 ft and under	52.00 to 53.00
No. 1 machinery cast.	53.00 to 54.00
No. 1 cupola cast.	49.00 to 50.00

St. Louis

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	19.00 to 20.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	24.00 to 25.00
No. 1 RR hvy. melting	44.00 to 45.00
Rails, random lengths	52.00 to 53.00
Rails, 18 in. and under	57.00 to 58.00
Angles and splice bars	50.00 to 51.00
RR specialties	49.00 to 50.00
Cupola cast.	53.00 to 54.00
Heavy breakable cast.	45.00 to 46.00
Stove plate	44.50 to 45.50
Cast iron car wheels	48.50 to 49.50
Rerolling rails	60.00 to 61.00
Unstripped motor blocks	45.00 to 46.00

Birmingham

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	23.00 to 24.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	40.00 to 41.00
Elec. furnace, 3 ft & under	38.00 to 39.00
Bar crops and plate	44.00 to 45.00
Structural and plate, 2 ft.	43.00 to 44.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	52.00 to 53.00
Rails, 18 in. and under	56.00 to 57.00
Angles and splice bars	49.00 to 50.00
Rerolling rails	61.00 to 62.00
No. 1 cupola cast.	53.00 to 54.00
Stove plate	53.00 to 54.00
Cast iron car wheels	44.00 to 45.00
Unstripped motor blocks	42.00 to 43.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	30.00 to 31.00
No. 2 dealer bundles	21.00 to 22.00
Machine shop turnings	11.00 to 12.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	15.00 to 16.00
Clean cast. chem. borings	22.00 to 23.00
No. 1 machinery cast.	39.00 to 40.00
Mixed yard cast.	37.00 to 38.00
Heavy breakable cast.	37.00 to 38.00
Stainless	
18-8 prepared solids	200.00 to 205.00
18-8 turnings	85.00 to 90.00
430 prepared solids	85.00 to 90.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	20.00 to 21.00
No. 1 bushelings	37.00 to 38.00
Drop forge flashings	37.00 to 38.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	21.00 to 22.00
Heavy breakable cast.	40.00 to 41.00
Mixed cupola cast.	46.00 to 47.00
Automotive cast.	51.00 to 52.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	80.00 to 85.00
430 bundles and solids	105.00 to 110.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	13.50 to 14.50
Shoveling turnings	16.50 to 17.50
Clean cast. chem. borings	16.50 to 17.50
No. 1 machinery cast.	41.00 to 42.00
Mixed cupola cast.	35.00 to 36.00
Heavy breakable cast.	35.00 to 36.00

San Francisco

No. 1 hvy. melting	$40.00
No. 2 hvy. melting	36.00
No. 1 dealer bundles	36.00
No. 2 bundles	22.00
Machine shop turn.	$17.00 to 19.00
Cast iron borings	17.00 to 19.00
No. 1 cupola cast.	47.00

Los Angeles

No. 1 hvy. melting	$41.00
No. 2 hvy. melting	35.00
No. 1 dealer bundles	36.00
No. 2 bundles	20.00
Machine shop turn.	$18.00 to 19.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Elec. furn. 1 ft and under (foundry)	49.00 to 50.00
No. 1 cupola cast.	47.00 to 48.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.25
No. 2 hvy. melting	28.25
No. 1 dealer bundles	32.25
No. 2 bundles	24.00
Mixed steel scrap	24.25
Bush., new fact., prep'd.	32.25
Bush., new fact., unprep'd	26.25
Machine shop turn.	14.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Cast scrap	$46.50 to 48.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$39.00
No. 2 hvy. melting	36.00
No. 2 bundles	26.00
Machine shop turn.	16.00
Shoveling turnings	20.00
Cut structural plate 2 ft & under	$47.00 to 48.00
Unstripped motor blocks	37.50 to 38.50
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	34.00 to 35.00

Ammo

for "Old Hickory"

On January 8, 1815, fifteen days after a peace treaty had been signed, General Jackson effectively fought from behind cotton bales to repulse the British at New Orleans. His ammunition, guns and howitzers came from Pittsburgh's first successful foundry—established in 1805 by Joseph McClurg, Joseph Smith and John Gormley—later known as McClurg's and McKnight's.

Today, hundreds of successful mills and foundries throughout the nation must maintain a continuing output of steel products—not only for the military, but also for the civilian requirements of more than 160 million people. And scrap is an indispensable ingredient.

For the purchase or sale of iron or steel scrap . . .

phone or write "Your Chicago Broker"

M. S.
KAPLAN
COMPANY

231 S. La Salle St., Chicago

Telephone ANdover 3-3900

Will Producers Raise Copper Prices?

Demand is building up, but strikes are holding down the supply of producers' copper.

Still, the trade believes producers will try to hold the current price level.

■ Copper producers may be called on, in the next few weeks, to demonstrate graphically how well they've learned the value of a stable price to the long term growth of their markets.

Right now most of the trade believes they'll pass the test.

Demand for copper is building up rapidly. Supply isn't. But the producers are still expected to hold prices at current levels. Here's the picture.

How Steel Affects Copper—The end of steel labor troubles brought a flood of pent-up demand for copper. Many copper buyers weren't hurt by the copper strikes because (1) They hedged quite a bit of metal before the copper strikes, and (2) They fabricate copper with steel, and the steel shortage conserved their copper, or made low stocks an academic problem.

But there are still strikes in copper. In November, 1959, it became obvious that the complicated copper labor picture made any "pace-setting" settlement unlikely. When Kennecott signed with the United Steelworkers, a glimmer of hope appeared. It has faded.

Complications—First of all, each company deals with a large number of unions, any one of which can close an entire plant. For instance, even though Kennecott and the Steelworkers have signed, the company is laying off some of its workers because strikes of other unions are hampering operations.

Anaconda is still struck over economic issues. And to further complicate things, one local attempted to defect and make its own settlement with the company. But the union leaders are yelling "foul" and some litigation is almost sure.

Phelps Dodge is still battling over a "no-strike clause." For a change, it's the union that wants to alter the contract language.

Holding Back — Buyers have been holding off the market as much as possible, waiting to pay the producers 33¢ per lb rather than refilling empty stocks at the premiums that traders and some dealers have been getting. But they can't hold back much longer.

Unless more capacity comes in within the month, the producers will easily be able to move what metal they have at 2¢ to 3¢ per lb more. The question is will they?

The Consensus—A sales executive of one producer pretty well sums up the consensus, "There certainly is pressure on copper. But marginal metal, from dealers and traders, will be the copper that reacts. Our price for primary copper is 33¢ per lb."

One indication that the apparent tightness is just objection to high prices and there is metal around: Scrap dealers are among the most vocal arguing against any sale of government-owned copper on the market. Since this would be refined metal and not in competition with scrap dealers, observers suggest dealers are holding back some metal for possible higher prices and don't want the market eased.

Lead and Zinc

Industry leaders, in Washington this week to try to convince the Tariff Commission that protection should be extended to manufactured articles, got a bit of a bad break in their timing.

While it doesn't directly change the situation, primary lead and zinc markets have perked up considerably in the last few weeks. Prodded mostly by markets that have come alive since the end of the steel strike, both are almost looking healthy.

About the latest zinc price hike, Howard I. Young, president, American Zinc, Lead and Smelting Co., St. Louis, says, "The advance brings the price to a more normal level for the zinc industry and is fully justified in view of the increased cost of labor, fuel, supplies and transportation."

Tin prices for the week: Jan. 6—99.25; Jan. 7—99.25; Jan. 8—99.375; Jan. 11—99.375; Jan. 12—99.50.*

*Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	26.00	24.70	12/17/59
Aluminum ingot	28.10	26.80	12/17/59
Copper (E)	33.00	30-33	11/12/59
Copper (CS)	35.00	33.00	12/23/59
Copper (L)	33.00	31.50	11/6/59
Lead, St L	11.80	12.30	12/21/59
Lead, N. Y.	12.00	12.50	12/21/59
Magnesium ingot	38.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	84.50	12/8/58
Titanium sponge	180-180	182-182	8/1/59
Zinc, E. St L.	13.00	12.50	1/8 60
Zinc, N. Y.	13.50	13.00	1 8/60

ALUMINUM: 99% Ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 107.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136 .249	.250- 3.
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250- 2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.13	.....	54.86	58.32
Brass, Yellow	50.57	50.86	50.26	54.23
Brass, Low	53.53	53.82	53.22	57.09
Brass, R L	54.58	54.87	54.27	58.14
Brass, Naval	55.12	.....	48.68	58.78
Muntz Metal	53.20	.....	48.26	.....
Comm. Bz.	56.17	56.46	55.86	59.48
Mang. Bz.	58.86	.....	52.21	.....
Phos. Bz. 5%	77.44	.....	78.19	.....

Free Cutting Brass Rod 36.06

TITANIUM

(Base prices f.o.b. mill)

Sheet and strip, commercially pure, $7.25-$8.50; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$6.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $7.55-$9.50; Bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.40
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base ... 1.31
Cobalt, 97-99% (per lb) ...$1.75 to $1.82
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 33.30 to 42.00
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9%, dollars per troy oz. $ 2.25
Iridium, dollars per troy oz....$75 to $85
Lithium, 98% .....$11.00 to $14.00
Magnesium sticks, 10,000 lb. 57.00
Mercury, dollars per 76-lb flask f.o.b. New York .....$212 to $214
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz..$22 to $24
Platinum, dollars per troy oz...$77 to $80
Rhodium .....$120.00 to $125.00
Silver ingots (¢ per troy oz.)..... 91.375
Thorium, per kg. $43.00
Vanadium .....$ 3.45
Zirconium sponge .....$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 30.75
- No. 120 ..... 29.25
- No. 123 ..... 28.75

80-10-10 ingot
- No. 305 ..... 35.25
- No. 315 ..... 33.00

88-10-2 ingot
- No. 210 ..... 44.00
- No. 215 ..... 40.75
- No. 245 ..... 36.00

Yellow ingot
- No. 405 ..... 24.75

Manganese bronze
- No. 421 ..... 29.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 26.25-26.50
- 0.60 copper max. 26.00-26.25

Piston alloys (No. 132 type)..28.00-29.00
No. 12 alum. (No. 2 grade)...24.75-25.25
108 alloy 25-25.75
195 alloy 27.75-28.75
13 alloy (0.60 copper max.)...26.00-26.25
AXS-679 (1 pct zinc) 25.00-26.00

(Effective Jan. 11, 1960)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 25.25-26.25
Grade 2—92-95% 24.00-25.00
Grade 3—90-92% 23.00-24.00
Grade 4—85-90% 22.50-23.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	29	28¼
Yellow brass	22¼	20¼
Red brass	25¾	25
Comm. bronze	26¼	26
Mang. bronze	20¾	20
Free cutting rod ends.	21¼	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 29½
- No. 2 copper wire 26
- Light copper 23¾
- *Refinery brass 24¼
- Copper bearing material 23¼

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 29½
- No. 2 copper wire 25½
- Light copper 23½
- No. 1 composition 23
- No. 1 comp. turnings 22¼
- Hvy. yellow brass solids 16¾
- Brass pipe 16¼
- Radiators 18

Aluminum

- Mixed old cast. ..... 14 —15
- Mixed new clips ..... 16½—17
- Mixed turnings, dry ..... 14½—15½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

- No. 1 copper wire ..... 25½—26
- No. 2 copper wire ..... 22½—23
- Light copper ..... 21 —21½
- Auto radiators (unsweated). 14½—15
- No. 1 composition ..... 18½—19
- No. 1 composition turnings... 17 —17½
- Cocks and faucets ..... 15 —15½
- Clean heavy yellow brass ... 13 —13½
- Brass pipe ..... 15 —15½
- New soft brass clippings .... 15¼—15¾
- No. 1 brass rod turnings .... 12½—13

Aluminum

- Alum. pistons and struts .... 7½— 8
- Aluminum crankcase ..... 11¼—11¾
- 1100 (2s) aluminum clippings 15 —15½
- Old sheet and utensils ..... 11¼—11¾
- Borings and turnings ..... 7 — 7½
- Industrial castings ..... 11¼—11¾
- 2020 (24S) clippings ..... 12½—13

Zinc

- New zinc clippings ..... 6¼— 6¾
- Old zinc ..... 4¼— 4¾
- Zinc routings ..... 3 — 3¼
- Old die cast scrap ..... 2½— 2¾

Nickel and Monel

- Pure nickel clippings 52-54
- Clean nickel turnings 40
- Nickel anodes 52-54
- Nickel rod ends 52-54
- New Monel clippings 30-32
- Clean Monel turnings 20-23
- Old sheet Monel 26-28
- Nickel silver clippings, mixed 18
- Nickel silver turnings, mixed 15

Lead

- Soft scrap lead ..... 8¾— 9¼
- Battery plates (dry) ..... 4¼— 4½
- Batteries, acid free ..... 2½— 2¾

Miscellaneous

- Block tin ..... 77 —78
- No. 1 pewter ..... 59 —60
- Auto babbitt ..... 40 —41
- Mixed common babbitt ..... 9¾—10¼
- Solder joints ..... 14 —14½
- Siphon tops 42
- Small foundry type ..... 10¼—10¾
- Monotype ..... 10¼—10¾
- Lino. and stereotype ..... 9¼— 9¾
- Electrotype ..... 7¾— 8¼
- Hand picked type shells .... 6 — 6½
- Lino. and stereo. dross ..... 2¾— 3¼
- Electro dross ..... 2¾— 3¼

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3,* $114.00 *T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8*	7.575 *W8*		8.40 *W8, S9,13*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1;* *C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

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STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.			Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*		† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.									6.40 *B3*				
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*				$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*			7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*		$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*				
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.									6.60 *L1*				
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*							
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*										
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*				
	Sterling, Ill.									6.50 *N4, K2*				
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*				
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*						
	Newport, Ky.	5.10 *A9*	6.275 *A9*											
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*		$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*									$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*				
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*								
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1**, *R3*	7.525 *R3, S1*	9.275 *R3,*					$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3, P6*		$10.40 *U1, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*				
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*				$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*				
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*				$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*												
	Kansas City, Mo.									6.65 *S2*				
	Los Angeles, Torrance, Cal.									7.20 *B2*				
	Minnequa, Colo.									6.65 *C6*				
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*		$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*		$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*				

* Electrogalvanized sheets.

(Effective Jan. 11, 1960)

*7.425 at Sharon-Niles is 7.225

STEEL PRICES

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		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.075 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3* 6.475 *T5*	9.025 *R3,R2* 8.775 *T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5* 9.225 *B5,P3, P8*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*					5.30 *N4*				8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, S12*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.675 *A8*									8.90 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Jan. 11, 1960) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Chicago, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Youngstown *R3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fontana *K1*	+10.75	+26.00	+7.75	+22.00	+4.25	+17.50	+1.75	+16.75	+1.25	+15.75	+0.75	+15.25	0.75	+15.50								
Pittsburgh *J3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Alton, Ill. *L1*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Sharon *M3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fairless *N2*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Pittsburgh *N1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Wheeling *W5*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Wheatland *W4*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Youngstown *Y1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Indiana Harbor *Y1*	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50								
Lorain *N2*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Youngstown *R3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Fontana *K1*	+6.25		+2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Alton, Ill. *L1*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Sharon *M3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Wheeling *W5*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Indiana Harbor *Y1*	5.75	+8.0	9.75	+4.0	12.75	0.50	13.25	+0.75	13.75	0.25	14.25	0.75	14.75	+0.50								
Lorain *N2*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.00¢ per lb.

(Effective Jan. 11, 1960)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2

High-carbon chromium.. .955 D-3, D-5
Oil hardened manganese .505 O-2
Special carbon ..... .38 W-1
Extra carbon ..... .38 W-1
Regular carbon ..... .325 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, C4, A3, J2*) 10 pct	Plate (*L4, C4, A3, J2*) 15 pct	Plate (*L4, C4, A3, J2*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 44.20; 1 side, 36.80.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Huntington, *C16*	.....	6.725	.....	.....	.....	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*	.....	.....	.....	.....	.....	15.35
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

COKE

Furnace, beehive (f.o.b.) Net-Ton
Connellsville, Pa. .....$14.75 to $15.50
Foundry, beehive (f.o.b.) $18.50
Foundry oven coke
Buffalo, del'd $33.25
Ironton, O., f.o.b. 30.50
Detroit f.o.b. 32.00
New England, del'd 33.55
New Haven, f.o.b. 31.00
Kearney, N. J., f.o.b. 31.25
Philadelphia, f.o.b. 31.00
Swedeland, Pa., f.o.b. 31.00
Painesville, Ohio, f.o.b. 32.00
Erie, Pa., f.o.b. 32.00
St. Paul, f.o.b. 31.25
St. Louis, f.o.b. 33.00
Birmingham, f.o.b. 30.35
Milwaukee, f.o.b. 32.00
Neville Is., Pa. 30.75

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1959 season. Freight changes for seller's account.

Gross Ton
Openhearth lump $12.70
Old range, bessemer 11.85
Old range, nonbessemer 11.70
Mesabi, bessemer 11.60
Mesabi, nonbessemer 11.45
High phosphorus 11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.... $185.00
High duty (except Salina, Pa., add $5.00) 140.00
Medium duty 125.00
Low duty (except Salina, Pa., add $2.00) 103.00
Ground fire clay, net ton, bulk... 22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. $158.00
Childs, Hays, Latrobe, Pa. 163.00
Chicago District 168.00
Western Utah 183.00
California 165.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville 163.00-168.00
Silica cement, net ton, bulk, Latrobe 29.75
Silica cement, net ton, bulk, Chicago 26.75
Silica cement, net ton, bulk, Ensley, Ala. 27.75
Silica cement, net ton, bulk, Mt. Union 25.75
Silica cement, net ton, bulk, Utah and Calif. 39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.$109.00
Standard chemically bonded, Curtiner, Calif. 119.00
Burned, Balt. 103.00

Magnesite Brick

Standard, Baltimore $140.00
Chemically bonded, Baltimore 119.00

Grain Magnesite

St. ¾ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk. $73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk 46.00
in sacks 52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:
Pa., W. Va., Ohio $16.75
Missouri Valley 15.60
Midwest 17.00

(Effective Jan. 11, 1960)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...		190	9.00	9.675
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	9.10	9.775
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*****	173	190	177	212	196	9.00	9.70
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dsv. *M4***	175	192	...	214	198	9.10	9.775
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	...	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3*****	173	190	177	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9*	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.325
Palmer,Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.60	10.15
Rankin, Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50†
SparrowsPt. *B3***	175	.....	.....	214	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Chicago	.....	.....	.....	15.60	.....
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
National Tube.....	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.50
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

Copper Powders

Electrolytic, domestic	48.25
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	$5.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	$3.60 to $3.95
Nickel	$1.05 to $1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	$1.07
Stainless Steel, 316	$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	$11.25
Tungsten	$3.15 (nominal)

* F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Bolts	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine				
½" and smaller x 3" and shorter	55	57	61	62
⅝" diam. x 3" and shorter	47	49½	54	55
¾" thru 1" diam x 6" and shorter	37	39½	45	46
¾" thru 1" diam. longer than 6" and 1⅛" and larger x all lengths	31	34	40	41
Rolled thread, ½" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter	48	50½	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

C. P. Hex, reg. & hvy.

¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

Hot Galv. Hex Nuts (All Types)

¾ in. and smaller	41

Semi-finished Hex Nuts

¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller	65

Rivets

Base per 100 lb

½ in. and larger	$12.85

Pct. Off List

7/16 in. and smaller	15

Cap Screws

Discount (Packages)

Full Finished H. C. Heat Treat

New std. hex head, packaged	Full Case
⅜" diam. and smaller x 6" and shorter	54 / 42
½", ⅝", and 1" diam. x 6" and shorter	38 / 23
⅜" diam. and smaller x longer than 6"	.. / ..
½", ⅝", and 1" diam. x longer than 6"	.. / ..

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	59	48
¾" through 1" dia. x 6" and shorter	45	32

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	60	60
Bulk		
Quantity		
To ¼" diam. incl. — 25,000-and over	60	..
5/16 to ½" diam. incl. — 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk		
⅜" diam. & smaller — 25,000-and over	15	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	48.00
Electrodeposited	40.00
Brass, 80-20, ball anodes, 2000 lb or more	53.00
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	19.75
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium, 5000 lb	1.30
Tin, ball anodes $1.05 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	65.90
Copper sulphate, 100 lb bags, per cwt.	27.75
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed, 100 lb	45.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.70
(Philadelphia price 25.00)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	45.50
Chromic acid, flake type, 10,000 lb or more	30.44

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (18 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24	.....	.....	.....	.....
Baltimore**	.10	9.90	10.10	10.16	11.55	10.00	10.65	10.15	11.90	17.48	16.48	21.58	20.83
Birmingham**		9.43	10.20	10.46	10.91	9.79	10.00	9.59	13.14	16.76	.....	.....	.....
Boston**	.10	10.52	11.27	11.87	12.17	10.42	10.72	10.34	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	9.80	10.50	11.40	11.30	10.25	10.40	9.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	8.69	10.35	11.10	10.35	8.62	9.16	8.79	10.80	17.10	16.10	19.70	20.45
Cincinnati**	.15	8.86	10.41	11.10	10.67	9.00	9.84	9.11	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	8.69[1]	9.89	11.09	10.47	8.88	9.67	8.90	11.40	17.21	16.21	21.31	20.56
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit**	.15	8.95	10.61	11.40	10.72	8.99	9.84	9.10	11.16	17.38	16.38	21.48	21.03
Houston**		9.65	9.65	.....	10.85	9.65	9.35	8.90	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles**		9.95[1]	11.55	12.20	11.55	10.00	10.00	9.10	14.20	18.30	16.45	21.30	20.80
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12.11	.....	.....	.....	.....
Milwaukee**	.15	8.83	10.49	11.24	10.49	8.76	9.30	8.93	11.04	17.24	15.34	21.24	19.09
New York	.10	9.27	10.59	11.45	9.74	9.87	9.84	10.09	13.35	16.16	15.60	20.10	19.35
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	8.30	9.35	10.99	9.35	9.25	9.20	9.50	12.05	16.58	15.58	20.08	19.33
Pittsburgh**	.15	8.69	9.84	10.91	10.45	8.62	9.78	8.79	11.40	17.10	16.10	19.70	20.45
Portland		10.00	11.75	13.30	11.95	11.50	11.10	9.85	15.30	18.50	17.45	20.75	20.25
San Francisco**	.10	11.00	11.95[2]	11.50	12.25	11.00	10.95	10.75	15.20	18.30	16.35	22.90	20.60
Seattle**		11.55	12.30	12.50	12.65	11.00	10.20	11.10	16.20	18.60	17.80	22.70	22.20
Spokane**	.15	11.70	12.45	12.65	13.30	11.15	11.35	11.75	16.35	17.75	17.95	21.58	22.35
St. Louis**	.15	9.07	10.73	11.48	10.73	9.00	9.76	9.17	11.43	17.48	16.48	21.58	19.33
St. Paul**	.15	8.95	9.46	10.69	10.47	8.75	9.48	8.85	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** These cities are on net pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅞" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 10¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter.

(Effective Jan. 11, 1960)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *V1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	73.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	31.75 48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7,* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge. Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet. *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

(Effective Jan. 11, 1960)

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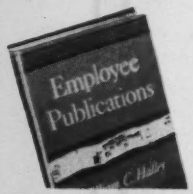

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CANTON, OHIO

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 37.25
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 28.25
0.025% C (Simplex) 36.75
5-7% C, 61-65% Cr, 5-8% Si 22.00
5% max C, 50-55% Cr, 2% max Si.. 25.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.
0.10% max. C $1.29
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min Cr. (Metallic Base) Fe 0.20 max.
Carloads $1.15
Ton lots 1.17
Less ton lots 1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.)
Carloads, delivered, lump, 3-in. x down, packed.
Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	28.25	14.60
Ton lots	33.50	16.05
Less ton lots	35.10	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.
Carloads, bulk 24.00
Ton lots 27.95
Less ton lots 29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads, bulk 23.00
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.
Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
Carload lots 18.45
Ton lots 19.95
Less ton lots 21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload bulk 19.20
Ton lots to carload packed 21.15
Less ton lots 22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:
Carloads, bulk 14.80
Ton lots packed in bags 17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.
95.50% min. Mn, 0.2% max C, 1% max. Si, 2.5% max. Fe.
Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.
Carloads 34.00
Ton lots 36.00
250 to 1999 lb 38.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk) P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.
Carloads bulk 12.80
Ton lots, packed 14.45
Carloads, bulk, delivered, per lb of briquet 15.10
Briquets, packed pallets, 2000 lb up to carloads 17.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe..	24.95	22.00
98% Si, 1.0% Fe	24.45	21.50

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.
Carloads, bulk 8.00
Ton lots, packed 10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....	20.00	

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.
Openhearth 3.20
Crucible 3.30
High speed steel 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb..	2.40	3.30	4.55

(Effective Jan. 11, 1960)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.
Carloads, bulk .. .. 9.85¢
Ton lots .. .. 11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 58-62% Cb, 2 in. x D, delivered per pound
Ton lots $3.45
Less ton lots..... 3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $255.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.15 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.
Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, fo.b. Niagara Falls, New York, freight allowed, in any quantity per pound ..... 30¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-3%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 18.25¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.. $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb and over
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
Ton lots (packed) $1.46
Less ton lots (packed) 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

ELECTRICAL POWER
EQUIPMENT IN STOCK

DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
1	3900	New Elliott	Enc. S.F.	475	320
1	3900	New G.E.	Enc. S.F.	475	320
1	3000	New Whse.	Enc. F.V.	525	600
2	2700	G.E.	MCF	415	280
1	2250	New Elliott	Enc. S.F.	600	200/300
1	2250	New G.E.	Enc. S.F.	600	200/300
1	2200	G.E.	MCF	600	400/500
2	2000	G.E.	MCF	350	230/350
2	1750	G.E.	MCF	250	175/350
4	1500	New Whse.	Enc. F.V.	525	600
2	1400	G.E.	MCF	250	165/300
1	1300	G.E.	MCF-12	300	200/400
1	1200	G.E.	MCF	600	450/600
1	1000	Whse.		500	800/2000
4	1000	GM.	D8	600	600/900
2	940	S.S.	Enc. F.V.	600	800/1000
2	800	G.E.	MCF	250	400/750
2	765	Allis Ch.	MHC	550	1012/1350
2	750	G.E.	MCF	600	450/900
1	750	G.E.	M.F.	600	120/360
4	600	Whse.		250	275/550
1	500	G.E.	MPC-10	250	188/400
3	450	Whse.		550	415
4	400	GM.	D8	250	300/900
2	400	G.E.	CY-275	300	1000/1500
2	325	Allis Ch.	MHC	250	450/900
1	300	Cr. Wh.	H-102 B.B.	230	1200
1	200	Rel. B.B.	T-664-D.P.	240	850
1	150	Cr. Wh.	CMC-65H	230	1150
1	150	G.E.B.B.	TLC-74	250	1150/3500
1	150	G.E.B.B.	CD	600	250/750
1	150	G.E.B.B.	CDP-115	230	1750
1	120	G.E.B.B.	TLC-50	250	1950/5000
1	100	Whse.	SK-180	230	450/1100
1	100	G.E.	CDP-145	230	1750
1	80	Whse.	SK-123.9	240	2000/4500
1	75	G.E.B.B.	CD-1235-D.P.	600	850

MERCURY ARC RECTIFIERS

3—150 KW, G.E., Sealed Tube Ignitron Unit Substation load centers 275 V. D.C., 2300 V. A.C. Pyranol filled transformers complete.

2—150 KW, G.E., Ignitron, 345 V. D.C.—230 V. A.C. air cooler transformers with controls.

MG SETS—3 Ph. 60 CY.

Qu.	K.W.	Make	RPM	DC Volts	AC Volts
1	2000	G.E.	514	600	2300/4600
2	1750/2100	G.E.	514	250/300	2300/4600
1	1700	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
1	1500	Cr.Wh. 4 unit	720	100	2300
1	500	G.G.	900	125/250	440
1	500	G.G.	900	250	230/4600
1	500	G.E.	1200	300	2300
1	350	G.E.	900	125	440/2300/4160
1	300	G.E.	1200	250	2300/4000
1	300	G.E.	1200	250	440/2300
1	250	G.E.	900	250	440/2300
1	240	Whse.	900	125	220/440
1	200	Whse.	1200	550	2300
1	200	El. Mhy.	1200	250	2300/4600
1	150	G.E.	1200	275	2300
1	150	Whse.	1200	275	2300
1	150	G.E.	1200	250	440
1	150	G.E.	1200	125	440
	140	Cr.Wh.	900	125/250	2300
1	100	G.E.	1170	250	220/440
2	100	Cr.Wh.	81160	525	220/550
1	100	G.E.	1200	250	2400/4100
2	75	Whse.	1200	125	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
2	3333	Whse.	OISC	1	13800 x 2300
3	1000	G.E.	CA/FA	1	13800 x 230/460
3	833	A.C.	OISC	1	4800/2400 x 480
3	833	A.C.	OISC	1	10175/13475x 2300/4000
2	750	G.E.	Pyranol	1	4800x85/55-25%/165
3	500	Mal.	C	1	6600/11430Y x 480
3	500	Kuhl	OISC	1	13200 x 6600
3	150	G.E.	OISC	1	33000x2300/4000Y
3	100	G.E.	HS	1	4800/8320Y x 120/240

CRANE & MILL MOTORS
230 V. D. C.

Qu.	H.P.	Make	RPM	Type
12	12/14	Whse.	700/800	MCA-30, Series
1	20	Whse.	975	K-5 Series
2	23	G.E.	650	MD8-408
1	35	Whse.	480	CK-9 Comp. S.B.
1	35	Whse.	480	CK-9 Sh. R.B.
1	45	Whse.	600	CK-9 Comp. S.B.
3	50	G.E.	650	COM-1830 Comp.
2	50	Whse.	595	CK-9 Shunt R.B.
2	50	Whse.	600	CK-9 Comp. R.B.
1	50	G.E.	525	COM-1830AEB.B.
1	50	Cr.Wh.	550	SW-50 Comp.
1	100	G.E.	475	CO-1832 S.B.
6	100-140	Whse.	600/415	MC-90 R.B.

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West Coast Dealers Expect Big '60s

Used machine dealers on the West Coast expect a good and steady market for the next 10 years.

Right now sales are picking up and most tools are moving well. However, there is a slight standstill on some items because of imports.

■ West Coast used machinery dealers see a big year ahead. In fact, 10 big years ahead.

The decade is sure to bring billions of dollars of metalworking business to the Farwest. The planning curves go one way: Up. Dealers can count on a fair share of the region's growing economy.

Full Blast—Southern California dealers expect buyers to hit them hard, fast and soon. And they're ready with floors full of machines.

During the quiet year-end months of 1959, dealers built inventories. Most machines came from government surplus stocks—very few from auctions. Special equipment is needed. And dealers are looking for it in the eastern and mid-western markets.

Top Sellers—What will southern California used machinery buyers go after? Sheet metal equipment will continue to rate the best seller spot. Behind this is the healthy state of the air-conditioning and electronics businesses.

Heavy equipment is also moving well. Typical hot item: 24-in. lathe with 10-ft centers. Anything over 20 in. seems to sell well.

Northern California dealers share the bright outlook. They point to bigger appropriations for capital spending. And predict it will be good for both the new and used lines.

One dealer, asked what's selling best, said "the things we don't have."

Foreign Competition — Plate working tools, like shears and brakes, are among better moving items. Used lathes don't do too well. Radial drills, at one time on the hot seller list, are now at a standstill. Reason: Stiff competition from foreign-made tools.

The tight money situation shows little effect on used machinery sales, dealers report. Customers who decide to buy don't seem to have financing troubles, they explain.

Northwest Market—The Pacific Northwest's used machinery market shows new strength. Industry sources there say machinery users are reluctant to make heavy capital investments. So the market for used equipment takes up the slack.

The demand for nearly all kinds of machines is on the upgrade. One exception: Very heavy equipment. There is little need for it. The Pacific Northwest economy seems to be swinging away from heavy industry.

COMPRESSORS

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87 CFM 1500 psi 6¼-3¾-1⅝ x 7 CP TCB2
100 CFM 125 psi 6 x 7 Ing. or Worth.
104 CFM 2500 psi 9¾-4¼-1-11/16 x 9 Ing. ES6
138 CFM 100 psi 7 x 7 Ing. ES-1
183 CFM 150 psi 7 x 7 Joy W6B
191 CFM 300 psi 9-4½ x 9 ES-2
234 CFM 100 psi 9 x 9 Ing.—Worth.
288 CFM 500 psi 10-4½ x 10 Ing.
290 CFM 75 psi 10 x 9 Ing. ES-1
311 CFM 1500 psi 10½-7⅛-3¾ x 13 Ing. ES-9
455 CFM 100 psi 15½-8 x 10 Bull-WJ5
485 CFM 100 psi 12 x 11 Ing.
502 CFM 125 psi 12 x 13 CP
585 CFM 100 psi 15-9¼ x 12 Ing. 9-80-4160
628 CFM 100 psi 14 x 13 Ing. ES
676 CFM 100 psi 15-9¼ x 12 Ing. XRB-Worth.
868 CFM 100 psi 16-11 x 14 Penn DB2
1055 CFM 100 psi 16-11 x 12 Ing. XRE
1335 CFM Van Si x 13 Ing. ES Worth. HB
2500 CFM 50 psi Penn. DE1-19-19 x 14
300 HP EM Syn Motor 3-90-2300
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Miles rebuilding often adds features not present in the original machine. Here Miles mechanics are preparing the bed of a 60 inch x 34 ft. Niles lathe to receive hardened steel wearing plates. The result is greater accuracy over a longer period of time.

Balancer: Tinius Olsen 2E016, prop. shaft, 1948
Borer: No. 7D Moline, vert. 6 spdl. cyl.
Boring Mill: 4" Universal, 60" vert., 96" long, 1942
Bulldozer: 180-ton No. 27 Williams & White
Centering Machine: 6" x 72" No. 56 Sundstrand
Chucker: 8½" 665 New Britain, 1943
Compressor: 40 HP & 75 HP 1-R & Gardner-Denver
Compressor: 868 CFM Sullivan, 2 stage, 125 HP
Cutoff, No. 3 Modern, 1943
Drill, Deep Hole: No. 420 W. F. & John Barnes
Drill: 21" Cin. Bick., SS, IL, late
Grinder, C'less: No. 2 Cinti., 1951
Grinder, Cyl.: 10" x 36 Norton type C hydr., 1943
Grinder: Int.: No. 271 Heald, 1951
Hammer: 100 lb. Murco upright
Lathe: 25" x 18' Axelson Hy. Dy. TA. 1942
Lathe: 126" x 96' oc Niles
Mill, Boring: 60" Gisholt, vert.
Mill: 5H K&T plain vert. hd., 1941
Mill, Planer: 42" x 42" x 18' Ingersoll
Planer: 66" Rockford Hydr. open side, 1941
Press: 125 ton No. F-1125-30 Clearing crankless
Press: 110 ton No. 675B Bliss high speed
Press: 200 ton No. 790½-72 Toledo toggle
Press: 250 ton Minster & Bliss Knuckle Jt. (2)
Press: 350 ton Clearing Crankless, 1945
Press: 600 ton No. 664 Toledo coining
Press: 90 ton No. 75 Bliss Cons. Horn
Press: 150 ton HPM Hydraulic SS, 1946
Press: 350 ton Elmes Hydr., 1944
Roll: No. 18 Kane & Roach straightener, 2½" bar
Shaper: 12 Pratt & Whitney vert.
Shear: 96" x ⅝" cap. Beatty, 1942
Shear: 38" throat New Doty, comb.
Slotter: 36 Rockford Hydr., 1943 (2)
Uncoiler: Cleveland 72 wide
Upsetter: 2" National, 1953
Upsetter: 4" National, air clutch, 1944

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REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

SLIP RING MOTORS
3 Phase—60 Cycle

Qu.	H.P.	Make	Type	Volts	R.P.M.
1	3500	G.E.	Mill	6600/4160	240
1	2500	G.E.	Mill	2300	296
1	1800	Whse.	Mill	2300	252
1	1200	G.E.	Mill	2200	295
1	1000	Whse.	C.W.	2300	441
1	500	Ideal	S-4-20	4800	708
1	500	Al. Chal.	ANY	2200	595
1	500	Al. Chal.	ANY	2200	293
1	400	Al. Chal.	ANY	2200	505
1	400	Whse.	CW	2200	290
1	350	G.E.	I-M	2200	1180
1	350	G.E.	MT-412	2200	450
1	300	Whse.	CW-1012	2200	704
1	250	Whse.	CW	4160/2400	710
1	250	G.E.	MT-414	2200	300

SYNCHRONOUS MOTORS
3 Phase—60 Cycle

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
1	6000	G.E.	Unity	2300	90
1	1750	G.E.	Unity	2200	3600
1	1500	Whse.	80%	2300	514
2 (new)	1400	Whse.	80%	4160	450
1	900	G.E.	Unity	460	300
1	700	El.Mchy.	Unity	440	200
1	500	El.Mchy.	80%	2300/440	720
1	450	Whse.	Unity	2200	128
1	300	G.E.	80%	2200/440	600

TRANSFORMERS
Outdoor—Oil Cooled—60 Cycle

Qu.	KVA	Make	Ph.	Prim.	Sec.
1	300	Whse.	3	11500	440
9	333	Amer.	1	2400/4160	120/240
1	450	Whse.	3	6900/11930	460
3	833	Al.Chal.	1	13200/11000	2300/4000
3	1000	Wagner	1	36000	2500/4330
6	1500	Whse.	1	24000	480
2	3000	G.E.	3	13800	480

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Bucket Elevators
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Tar Precipitator
Steel Storage Tanks
2—50,000 gal; 3—16,000 gal.
2—10,000 gal; 1—8,000 gal.
2— 5,000 gal; 1—1,000 gal.
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2 spindle No. 410 W. F. & John Barnes, m.d.
No. 410 W. F. & John Barnes, Horizontal Boring & Drilling Machine, m.d.
No. 410 Barnes Single Spindle Deep Hole, m.d.
No. 2 Avey Style MA1, with horizontal operation
No. 1/28x50" Pratt & Whitney Gun Barrel Rifling, Model M1821, m.d., latest
No. 1½"x105" Pratt & Whitney, 2 spindle Hydraulic Deep Hole Drill, Model 973, m.d., latest
No. 1½"x105" Pratt & Whitney, Model M1825, 2 spindle Gun Barrel Rifling, m.d.
No. 1 Model M509 Pratt & Whitney 2 spindle Deep Hole Drill, belted m.d.
Natco Horizontal Drill, 2 opposed B4F2 Head, 1943
¾"x40" Bausch Double Horizontal Drilling Machine, m.d.
No. 445 W. F. & John Barnes Independent 2 spindle Deep Hole Drilling & Boring Machine, late
No. 2F1 Natco Horizontal Boring & Drilling Machine
Natco, Holesteel Model, m.d.

GEAR SHAPERS
Type Z Fellows Horizontal, m.d.
No. 4 Fellows Enveloping Gear Generator, m.d.
No. 12 Fellows Gear Shaving Machine, m.d., late
No. 7 Fellows, 1945
No. 7, 7A Fellows Gear Shaper, belted m.d.
No. 18 Fellows Gear Finishing Machine, m.d.
No. 61A Fellows, m.d., latest type, 1945
No. 645A3 Fellows, vee belt drive
No. 645Y Fellows, m.d.
No. 70 Cross Deburring Machine, m.d., 1940
No. 72 Fellows H.S. Spur Gear Shaper, m.d.
No. 75 Fellows, H.S., m.d.
No. 75A Fellows H.S. Spur & Helical, m.d.
No. 712 Fellows, m.d.
No. 725 Fellows, 1945

GEAR CUTTERS
No. 12 Gleason Straight Tooth Bevel Gear Rougher, m.d.
No. 36 Gould & Eberhardt Bevel & Spur Gear Rougher, m.d.
No. 48 Fellows Gear Burnisher
No. 88 Fellows Gear Burnisher
3" Gleason Gear Generator, m.d.
48" Gleason Automatic Bevel Gear Planer, m.d.
No. 5AC Lees-Bradner Heavy Type Gear Generator, m.d.
No. 4-48" Brown & Sharpe, m.d.
No. 50 Cross Clutch Miller, m.d.
No. 5-60" Brown & Sharpe Gear Cutter, m.d.
W. C. Lipe Gear Chamfering, m.d.
No. 7125A Fellows H.S., m.d.

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1—500# LECTROMELT—200 KVA
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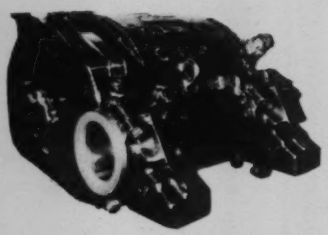

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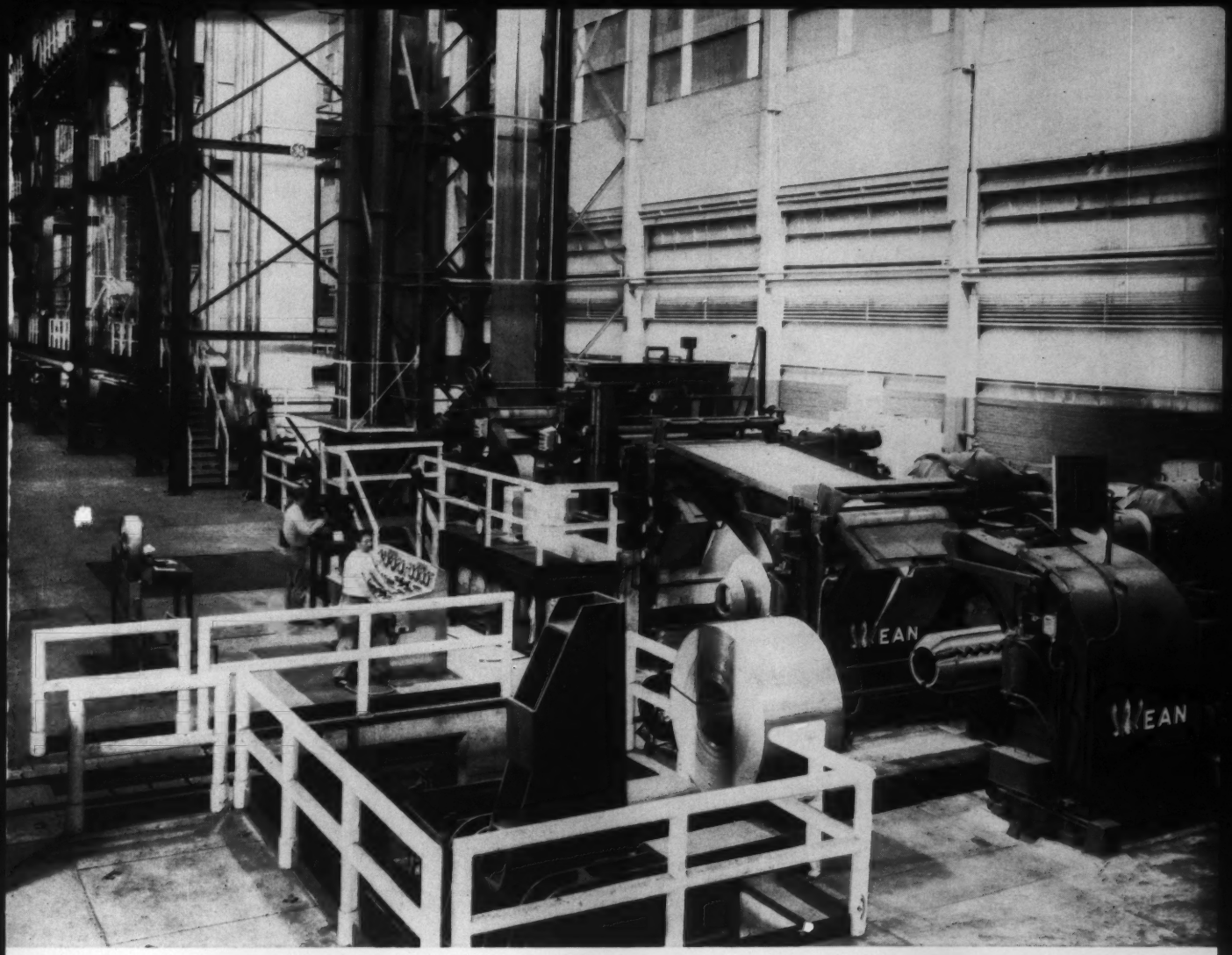

Wean incorporates new design features in Wheeling Steel's tin plate annealing line

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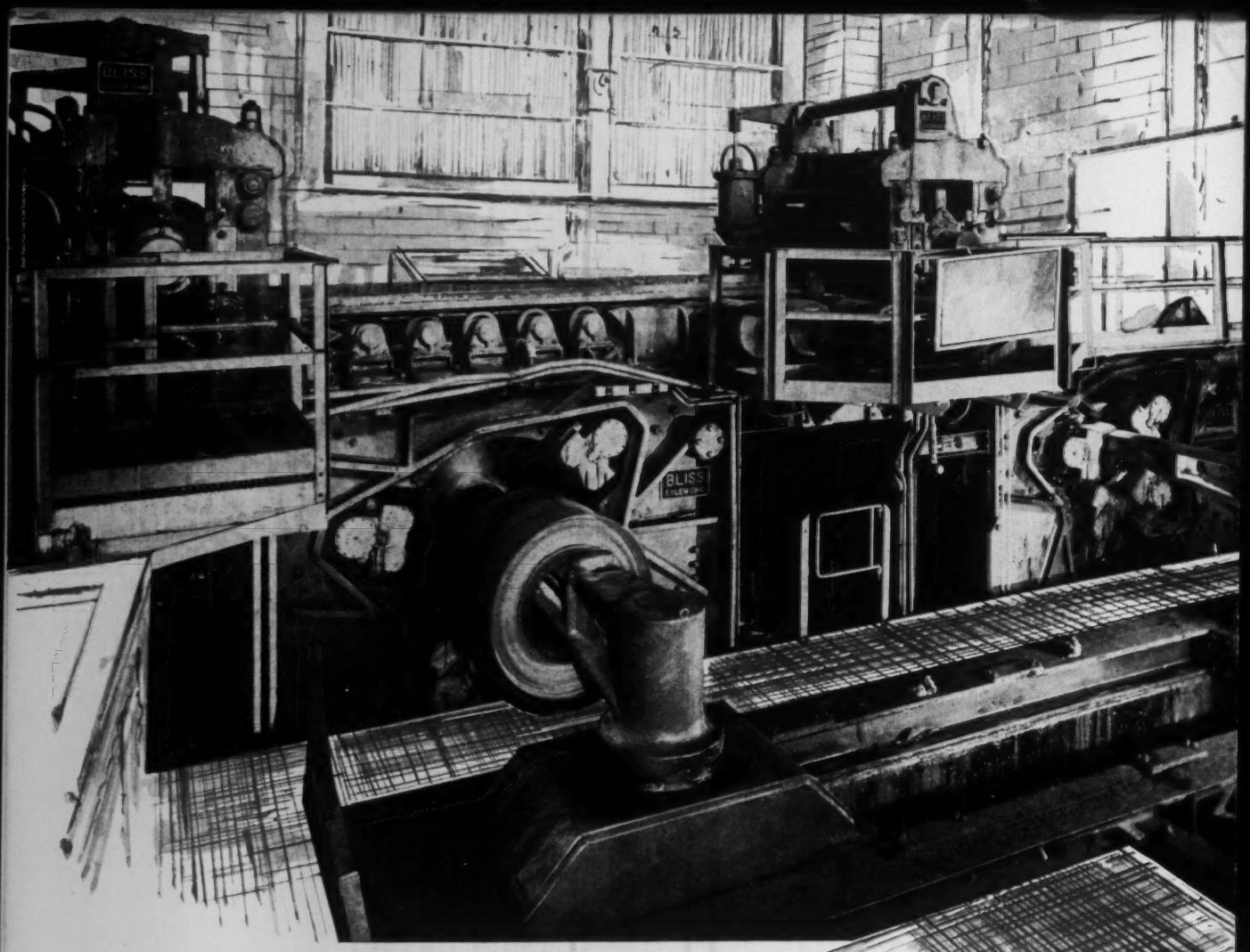

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